

1995 Biennial Energy Report

Issues and Analyses for
Washington's Legislature

January 1995

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Message from the Director

Keeping a watchful eye on Washington's energy concerns is the responsibility of the Washington State Energy Office. Every year in Washington, we spend \$10 *billion* to light and heat our homes and offices, run our transportation systems and operate our vehicles, farms and industries. The 1995 Biennial Energy Report serves as a guide to help you become familiar with the energy issues we all face as Washington prepares to meet the 21st Century.

The mission of the Energy Office is to serve the citizens of Washington by providing innovative leadership for a sustainable energy future that is environmentally and economically sound. Indeed, in the public sector alone, we've already provided taxpayers more than \$17.5 million in lifetime energy savings by working with state agencies, schools and universities to lower their consumption of energy.

Mandated to do so through legislation and by executive order, the Energy Office takes the lead on implementing the Washington State Energy Strategy: The strategy contains numerous recommendations that can increase energy efficiency, improve environmental quality and assure cost-effective energy supplies to support a viable economy.

The Energy Office manages a range of services and programs in order to motivate utilities, business, industry and residents to make sound energy choices that will build a sustainable future. On the policy side, we monitor petroleum supplies and energy production for energy emergency preparedness, and we provide analysis on emerging economic and environmental issues. But energy choices aren't always made on the broad policy stage. When utilities, business and industry seek to reduce their energy costs and consumption, they come to the Energy Office for leadership, ideas and technologies. When builders, developers and architects need to navigate through the state's energy and ventilation codes, they come to the Energy Office for insights and know-how. And when residents strive to bring energy costs down to a manageable size, they turn to the Energy Office for tools and information.

We in Washington have enjoyed an abundant and inexpensive hydroelectric resource to power our aerospace, forest products and aluminum industries. But our region's population and economic growth, environmental needs - such as fish, air and water-and regulatory changes all contribute to the complexities of providing reliable and abundant power. Such challenges, coupled with concerns about our dependence on fossil fuels for heating, transportation and power generation, make it all the more important that Washington plans for its energy future.

I encourage you to read this document carefully, use it for reference and weigh its conclusions as you consider the challenges and opportunities energy poses for the people of Washington. If I can be of further assistance to you, please don't hesitate to contact me.

Judith Merchant

Judith Merchant
Director, Washington State Energy Office

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Executive Summary

Each year, Washington's residents, business and industries spend \$10 billion on their energy costs. The factors affecting those costs are driven by events and forces inside and outside the state. Today, we're seeing a changing electric utility industry, lower natural gas prices, less emphasis on alternative fuels for transportation and other changes we couldn't predict a few years ago. And, additional changes are coming in the future. The 1995 Biennial Energy Report provides a context for understanding the coming changes. The report focuses on electric utility restructuring, changes within the Bonneville Power Administration, plutonium disposition, energy emergencies, the Washington State Energy Strategy' and Washington's energy future.

Electric Utility Restructuring

Electric utility restructuring is the term used to identify all the regulatory and technological changes taking place in the industry. Major changes are taking place that will influence how the region acquires resources and who pays for them. The report identifies a number of beneficial impacts of structural changes to wholesale and retail electric markets. It has also provided some warnings concerning potential drawbacks. Collectively, this information points to four key conclusions:

- Siting laws and processes must benefit the public by balancing the needs of development, utilities and environmental interests.
- Structural changes in the electric industry could reduce short term costs but also adversely affect integrated resource planning.
- There is no pressing need to encourage or even establish retail access as a feature of the electricity structure in Washington state.
- There appear to be asymmetries between Washington utilities' obligation to serve and their "right" to serve certain customers.

Bonneville Power Administration

The Bonneville Power Administration plays a major role in the electric energy field for the entire Northwest region. Like virtually all utilities in the country, Bonneville is feeling the pressures brought on by increased competition in wholesale and retail markets. Bonneville faces additional financial pressures, however; due to its statutory responsibilities under the Northwest Power Act. While responding to these rapid changes, it is important to remember that:

- It is a state priority to keep the Bonneville Power Administration a low cost supplier of power and power services' to public and private electric utilities.

- It is a state priority to ensure that Bonneville Power Administration's actions are consistent, with fish and wildlife objectives of the Northwest power Act as well as with the Endangered Species Act.
- Bonneville's new initiatives, such as the draft business plan and power sales contract negotiations, should affirm its responsibilities under the Northwest Power Act and the goals of regionalism embodied in the Northwest Power Act should remain intact.

Plutonium Disposal

The National Academy of Sciences has identified three "preferred" methods of disposal for weapons-grade plutonium. In two of them: burning in reactors and vitrification, Washington state could figure prominently. The Energy Office and the Washington State Department of Ecology must continue to monitor' U.S. Department of Energy's determinations regarding plutonium disposal.

Energy Emergencies

Supply shortages or disruptions can ultimately affect every person and every economic sector in the state. The ability to anticipate supply shortages, and respond appropriately to supply disruptions can help mitigate the severity of emergencies. By statute, the Energy Office is responsible for coordinating a response to petroleum and electricity supply shortages and for administering the Governor's energy emergency powers. The .state should continue its work in anticipating power supply shortages and developing appropriate responses in order to help mitigate the severity of energy emergencies.

Energy Strategy

Washington's Energy Strategy provides an organized framework to guide Washington's decisions into the next century. Its recommendations rely on known cost-effective technologies, beginning with improved efficiency, renewable resources, and wise use of natural gas. The Strategy provides the guidance for the Energy .Office's activities. Through legislative and gubernatorial action, the Energy Office has lead for implementing the Strategy.

Washington's Energy Future

Washington's economic and environmental health is clearly linked to its ability to maintain an affordable, safe and reliable energy supply. The Energy Office serves the people of Washington as a leader in developing energy policy and as an innovator in bringing new energy technologies, techniques and practices into our state; all the while providing the citizens with reliable, objective and timely information on energy needs and issues. Our role in improving the energy efficiency of Washington's economy and reducing energy costs, as well as providing leadership in the implementation of the state's Energy Strategy, are key factors in providing for a sustainable' energy future for the citizens of Washington. It is our goal to continue to play a leadership role where needed, a catalyzing role when useful and a supportive role when helpful to ensure a safe, affordable, reliable and environmentally sound energy future.

Introduction

Just beyond the reach of everyday headlines lies a combination of events that will reshape energy markets in the state, region and nation. The 1995 Biennial Energy Report to the Washington State Legislature provides a context for understanding the coming change.

Beyond Washington's Borders

To a very large extent, energy issues in "Washington are driven by events and forces outside the state. For example, global fossil fuel supplies have proved far more extensive and recoverable than previously thought, keeping prices low. Technological advances have affected all aspects of energy production and use--lowering costs, improving efficiency, and reducing emissions. On the heels of natural gas deregulation, legislated electric utility deregulation at the federal level seeks to increase competition in the United States' electricity markets. Regionally, wholesale marketers like the Bonneville Power Administration and other utilities are responding by cutting costs and reassessing goals and strategies for acquiring new resources.

These changes have affected the costs, risks, and environmental impacts of all energy resources, changing the relative costs and benefits of each and influencing the choices to be made in the state and region. For example, some years ago rising gasoline prices and extensive air pollution made alternative fuels look like a good idea. Industry responded by developing emission controls that have helped Washington meet most federal air quality standards. At the same time, oil prices dropped significantly. Collectively, these events have made alternative fuels less cost effective.

Today, the electricity sector presents the greatest challenges because the region no longer enjoys a surplus and must choose new emergency resources. These choices must be made in a new context, one that gives Consideration to endangered salmon, more competitive markets, and low natural gas prices.

The Northwest Power Plan and Washington's Energy Strategy

Every five years the Pacific Northwest Electric Power and Conservation Planning Council is required to prepare an analysis of resource alternatives and publish the Northwest Conservation and Electric Power Plan that lists priority resources for the *region* to acquire. This plan recommends a mix of resources that meets operational requirements, provides for a reliable system, and minimizes costs and environmental impacts. While the relative costs and benefits of resources change over time, the Power Plan has always recommended that cost-effective conservation, renewable resources, and high-efficiency thermal resources be acquired. The Power Plan recommends these resources because they have low overall costs and limited environmental impacts. Increasing competition in the electric utility industry, and issues such as salmon recovery, will influence the resource alternatives recommended in the next Power Plan. That plan will be published in 1996. Washington's Energy Strategy, developed at the request of the Washington State Legislature, articulates the *state's* goals for new resource acquisition. While focusing on Washington, it entirely supports the goals of the Power Plan. The Strategy specifically calls for implementing all cost-effective conservation, investing in a diverse portfolio

of resources that provide operational flexibility and risk management, and implementing energy policies that minimize environmental damage.

The Strategy affirms the principle that wise resource selection supports both the economy and the environment.

Economics of Energy

The United States

For most of this century, total energy use grew in step with economic growth and grew faster than the population grew. Since 1979, per capita energy use in the United States has stabilized, and total energy use has grown slower than the economy. This change is partly the result of higher energy prices that occurred in the late 1970s and early 1980s.

The rapid increases in all energy prices were driven by increases in oil prices. However, oil prices rose because producing countries held supplies off the market, not because the world was running out of oil. Higher prices encouraged producers to seek new supplies in nations that are not members of the Organization of Petroleum Exporting Countries (OPEC) and they found them. This new production drove prices down and fundamentally changed the oil market; OPEC countries now supply less than half of the world's oil and no longer dictate the price.

After adjusting for inflation, energy prices today are about the same as they were in 1979, and they have been stable or falling slowly since 1988. Several important government actions also contributed to price stability.

- State utility commissions began requiring electric and gas utilities to run energy conservation programs when saving energy cost less than supplying it.
- The federal government set efficiency standards for new cars and new appliances. States, including Washington, incorporated energy efficiency standards in their building codes.
- Federal price controls on interstate natural gas sales were lifted beginning in 1979. These controls had effectively limited the market for newly discovered gas to the states where it was found, and discouraged exploration for new supplies. Once controls were lifted, supplies expanded and prices in all consuming states fell into line with prices in the producing states.
- Improvements in technology have lowered the costs of producing energy. While oil and gas producers have had to drill deeper wells, drill in more remote locations, and go after smaller pools, technological improvements have lowered their drilling costs and increased their success rates. In electricity generation, the newest combined-cycle gas combustion turbines use 30 to 40 percent less fuel than older power plants.
- Improvements in technology have also lowered the cost of conserving energy. More efficient cars, furnaces, windows, and energy management systems allow consumers to get the same end results with less energy.

Washington State

Washington residents use slightly more energy than the national average for two reasons: Electricity is used here for more purposes; and Washingtonians drive more than the national

average. The following information reflects energy trends **at this point in time**¹. A number of factors, many addressed in this report, could influence the future mix of energy resources in Washington, and their costs.

Electricity. Washingtonians consume about 67 percent more electricity per person than the national average because the electric rates here are lower than any other state. Washington's cheap hydroelectricity is worth about \$2.4 billion per year to the state, or about \$480 per person². This is equivalent to an annual bonus of two percent on top of state average income.

Overview of the Biennial Report

Electric utility restructuring is the term used to identify all the regulatory and technological changes taking place in the industry. Section 1 of this report focuses on these major changes, which will influence how the region acquires resources and who pays for them. While the Energy Office believes that the state's residents will benefit from increased competition in the electric utility industry, it also sees a potential for unintended results. For example, the restructuring process may lead to slowdowns in the acquisition of conservation. Residential customers may face higher rates if industrial customers leave utilities to buy cheaper power from independent power producers.

Section 2 covers the reinvention of the Bonneville Power Administration as it attempts to respond to a more competitive environment. Here, too, a dilemma exists. Will Washington benefit, or will competition precipitate policy changes at Bonneville that affect the acquisition of priority resources and the administration of fish and wildlife programs?

Proposals from other federal agencies may also have consequences for Washington state. Will the United States choose to use facilities in Washington for the disposition of weapons grade plutonium? The Clinton administration and the U.S. Department of Energy are considering burning plutonium in commercial nuclear reactors. The Washington Public Power Supply System has proposed two reactors on the Hanford Reservation be used. Section 3 outlines the status of this national concern and the issues that play into a final decision.

Section 4 introduces the issue of energy emergencies--supply shortages or disruptions--and their potential effects on Washington's people. The major threat would come from emergencies involving electricity. In the past, the Northwest's vast hydroelectric system has kept the region from experiencing shortages of electricity to any great degree. As that system becomes a smaller part of the regional resource base, the state needs to keep a watchful eye on conditions that could lead to insufficient electricity during cold winters.

In the last two sections, the Energy Office more explicitly discusses the goals of Washington's Energy Strategy and identifies the work underway to manage the state's energy future. The evolving issues described early in this report eventually may affect the desirability of certain recommendations in the Strategy. However, overall the Strategy remains a viable guide for Washington's energy policy. The Energy Office is pleased to report progress in a number of important areas:

- Business and government are working together to implement the transportation-related provisions of the 1991 Clean Air Act, which established the commute trip reduction (CTR.) program. The Energy Office and the Washington State Department of Transportation are

working together to implement Strategy recommendations, other than CTR, that address Washington's transportation challenges.

- Quantifiable advances in the energy efficiency of Washington's buildings continue to be made. For example, a study by Battelle Pacific Northwest Laboratory shows that the average home built to the state's 1991 energy code is achieving 97 percent compliance.
- Interest in renewable energy resources such as wind, solar, and geothermal, continues to grow throughout Washington. Projects underway in the near term involve public and investor-owned utilities, private industry and the public sector.
- The Energy Office has compiled an inventory of the state's greenhouse gas emissions, as recommended in the Strategy. A plan that outlines options for reducing these emissions will be completed in 1995.

The final sections provide additional narrative on these successes and others that affect Washington's energy future.

Natural gas. Natural gas use per person is about half the national average. This is primarily because of the mild winters in the populous western part of the state and low electricity prices. In Washington, affordable electricity prices have led to heavy use of electricity for heating and other uses; other regions rely more on natural gas to address these needs.

Coal. Coal consumption per person is about 76 percent less than the national average. Nationally, the largest use of coal occurs in electricity generation. Washington primarily uses hydropower, not coal, to fuel electricity generation.

Petroleum. Petroleum use per person is 12 percent above the national average, largely because Washington's residents drive seven percent more.

The following figures show the sources of energy for the state and the percentage of energy used in each sector of the state's economy.

Figure 0-1 Where Our Energy Comes From

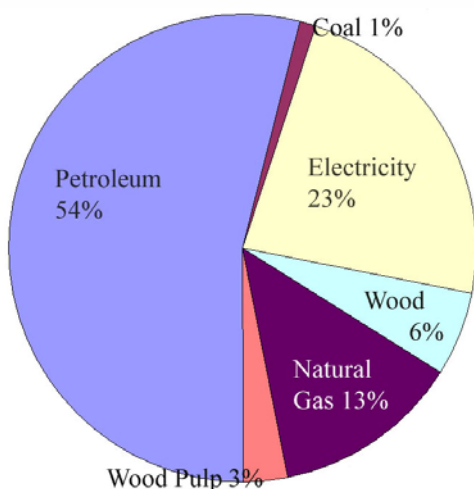
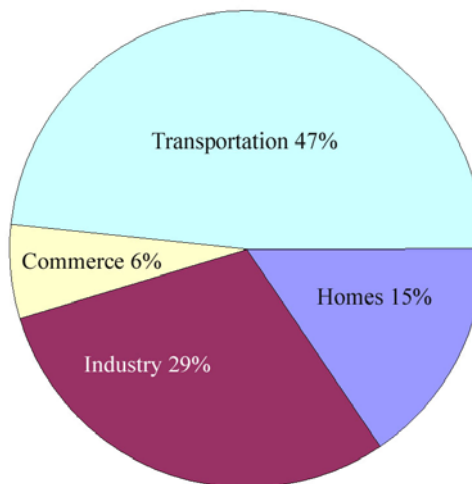


Figure 0-2 Where We Use Energy



Energy Use in Washington, 1993

1 Data for this section, including graphs, come from two sources: USDOE/EIA, State Energy Data Report, 1992; and Economic Revenue Forecast Council, State of Washington Economic and Revenue Forecast, 1994.

2 Washington State Energy Office Use Profile Database.

Section 1

Restructuring the Electric Utility Industry

The stage is largely set to have more competition occur at the wholesale level. Retail markets continue to reflect the historical relationships between utilities and end users. However, there are rumblings throughout the nation that dramatic changes may be coming to the retail level as well.

Historical Structure, 1930s to 1980s

Washington's electric retail sales are about evenly divided between investor-owned and publicly owned utilities. In Washington, whether a utility is publicly or privately owned greatly influences how that utility is regulated and operated. For example, in Washington state and most of the country, the electricity industry in the private sector is vertically integrated; an electric utility builds and operates its own generating plants, transmission lines and distribution lines, and provides meters to end-use customers. Some electric utilities in other parts of the country even own natural gas fields and coal mines to supply fuel to their generating plants. Privately owned utilities in Washington state and elsewhere also operate under "cost of service" regulation, which means that a regulatory body (in Washington, the Utilities and Transportation Commission) sets electric rates designed to cover the cost of doing business, plus a reasonable profit to investors.

On the other hand, most publicly owned utilities in Washington are not vertically integrated. Generally, they take part or all of their power from the Bonneville Power Administration, which provides a broad range of services that includes generation and transmission. Publicly owned utilities in Washington state are not centrally regulated; they are usually governed by elected boards or town and city councils.

During the growth decades of the 1930s to early 1970s, federal and state policy encouraged electric utilities to expand rapidly, extending service to virtually all citizens and developing new uses for electricity. Expansion of electric service was a key feature of the New Deal. Utilities devoted little time to developing sophisticated forecasting methodologies: they assumed electricity use would grow in the future at roughly the same rapid rate as it had in the past.

Further, utilities began increasingly to design and build large central generating facilities, either cooperatively with other utilities or on their own, on the assumption that the economies of scale that exist for transmission and distribution also existed for generating plants. Experience of the late 1970s and 1980s proved, however, that these economies of scale would not always exist.

The environmental movement, concerns over increasing costs, Three Mile Island, and the energy crises of the '70s allied to upheavals in the electric industry. The most significant event was probably passage of the Public Utility Regulatory Policy Act of 1978 (PL 95-617) (PURPA). PURPA had multiple purposes, including promoting the development of alternative generating resources to central generators. PURPA required utilities to purchase power from independently owned "qualifying facilities" if those facilities met certain operating and ownership criteria.

Another major development was the widespread adoption of "integrated resource planning" or IRP. Virtually all states have now adopted IRP as a regulatory or statutory policy. IRP requires utilities to consider a broad range of options to meet their customers' needs. These options

include programs to encourage customers to use less electricity or to use it more efficiently, if the programs cost less than building generating facilities. These programs are termed "demand side management." In Washington state, investor-owned utilities are required to develop IRPs, while publicly owned utilities typically rely on Bonneville to acquire resources consistent with integrated resource planning principles established by the region's Power Plan.

Declining Cost and Competition in the Wholesale Market

Declining Cost for Gas-Fired Generation

The term "wholesale power" refers to power that is generated either by a utility or an independent power producer (IPP), and sold to someone other than an end user, e.g., another utility. The early '90s have brought two major changes that affect wholesale markets. The first is the rapid decline in the cost of generating electricity with natural gas. This is due partly to improvements in technology that have brought down the cost of natural gas generation, and partly due to drops in natural gas prices. Figure 1-1 shows historical natural gas prices for electricity generation in Washington state. Figure 1-2 shows the typical historical cost per kilowatt of a combined cycle power plant¹. Both cases show a drop in real (inflation adjusted) price.

Figure 1 - 1

Natural Gas Prices - Electric Sector

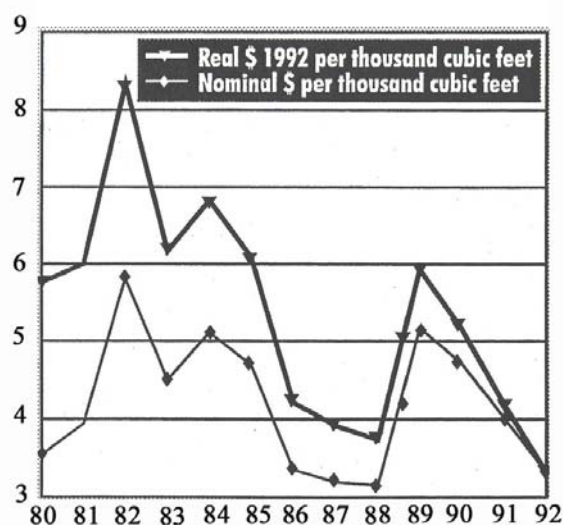
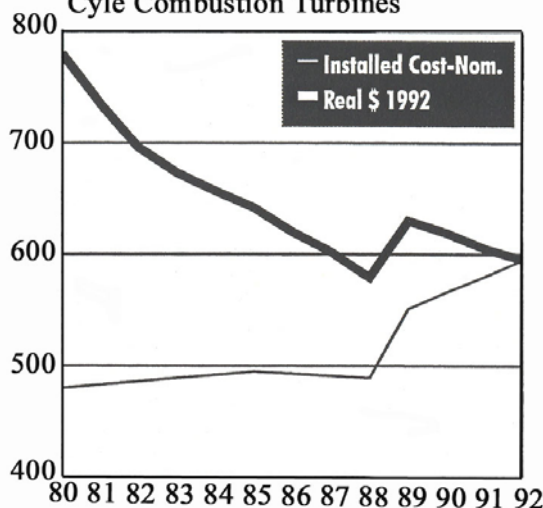


Figure 1 - 2

Capital Cost Combined
Cycle Combustion Turbines



This means that new power plants can come on line in a relatively short amount of time and can operate relatively cheaply. Since PURPA fostered the development of a market for independently owned generation, an independent power producer can produce electricity for a price that challenges, and often beats, the cost of generating with existing power plants. Before PURPA, independent power constituted approximately 3 percent of total electricity generated in the United States. Most of that was self-generation, that is, the generation was used internally by a large industrial facility. Today, the percentage is approximately 10 percent². The integrated resource plans of Washington's three investor-owned electric utilities show that about 32 percent of new resources for these utilities are expected to come from independent power.

Energy Policy Act of 1992

Passage of the National Energy Policy Act of 1992 (PL 102-486) (EPACT) also affects the wholesale market, in two major ways. Both are intended to result in increased competition at the wholesale level, with the hope that increased competition would foster lower costs and greater efficiency.

For wholesalers, the first significant provision of EPACT is to free up the independent energy market from federal regulation. Prior to EPACT, only qualifying facilities were exempt from regulation as public utilities at the federal level. Qualifying facilities had to meet certain operating, ownership, and fuel criteria. No under EPACT, any generator who applies to the government and demonstrates that its plant is purely for wholesale power sales can be certified as an "Exempt Wholesale Generator" and thereby be exempt from regulation as a public utility (EPACT § 711). This provision removes some of the few remaining constraints on the establishment of independently owned generation.

The second significant set of provisions of EPACT for wholesalers relates to transmission access. Until Congress enacted EPACT, electric utilities that owned transmission lines could decide whether to grant access to other utilities or IPPs.

EPACT amended the Federal Power Act to require transmission owners not only to make transmission available, but also to build transmission facilities if necessary to accommodate those seeking access to transmission for wholesale transactions (EPACT §§ 721 et seq.). Analysts expect that this provision of EPACT will dramatically increase the numbers of wholesale transactions that can occur as a result of "open access" to the transmission system.

Increased Choices in the Retail Market?

The term "retail market" means marketing to end users, such as residential electricity customers. Historically, utilities have supplied virtually all power for electricity consumption. In most of the country, utilities usually have franchises to serve allocated service territories or groups of customers³. In exchange for the right to serve these customers, the utilities also take on an obligation to serve them. This exchange is sometimes termed the regulatory compact.

Retail markets continue to reflect the historical relationships between utilities and end use customers. However, there are rumblings throughout the nation that dramatic changes may be coming in these relationships.

The first "change" took place during the drafting of EPACT. Some industrial customers argued that, in addition to requiring transmission owners to provide access to wholesale marketers, they should also provide access-also known as retail wheeling-to retail marketers, such as IPPs or other utilities. Congress did not adopt this suggestion. Rather, EPACT contains a provision that leaves the decision about retail wheeling in the states' hands.

EPACT did not change the current law. However, by mentioning the possibility of retail wheeling, EPACT began a national debate over whether such access is desirable. Since EPACT, several states have considered or proposed limited retail wheeling or are opening inquiries into whether retail wheeling should be implemented. Two states that are at the center of most national discussions are California and Michigan.

The California Public Utility Commission (CPUC) staff originally proposed that intrastate transmission access be gradually opened up to retail customers, one class at a time, over a period of several years. Following extensive hearings on the staff proposal, the CPUC has very recently announced a new set of hearings and established a working group of utilities and others to look at a broad range of options. These include unconstrained retail and wholesale competition, "managed retail and wholesale competition" in the form of purchasing pools, and reform on the wholesale level only. Because of the importance of California to Northwest power markets, the Energy Office and others in the Northwest have been following the evolving California proceeding with great interest.

The Michigan proposal involves a five-year experiment whereby 60 MW of Consumers Power load and 90 MW of Detroit Edison load would be able to take advantage of retail competition. The proposal is currently being challenged on appeal.

In mid-1994 the Federal Energy Regulatory Commission (FERC) surprised many by issuing a proposed rule that, among other things, asserts federal jurisdiction over the rates to be charged to potential retail transmission users. This position, if it withstands legal scrutiny, could make it difficult for state regulators such as California's to formulate transmission rates that compensate utilities to their satisfaction for stranded investment (See discussion of stranded investment on page 10) and other costs associated with a customer leaving the utility. The debate over retail wheeling, rate jurisdiction, and associated issues will likely rage for several years before any consensus emerges on a "correct" approach.

Competition - The Natural Gas Experience

The 1991 Biennial Energy Report noted that the natural gas industry was undergoing changes to make access to interstate pipelines available at the retail level. Since 1991, a number of former retail customers of the gas utilities in Washington took advantage of retail access.

The most common practice is for large industrial customers, and occasionally some commercial customers, to become "transportation" customers of the local gas distribution company (LDC). This means that the customers ask the LDC to contract for enough interstate pipeline capacity to serve them, and the LDC builds sufficient distribution capability to serve at least their energy needs, and perhaps their peak capacity needs. However, the customers arrange to purchase gas commodity (molecules of natural gas) independently.

Another option available to these customers is to negotiate independently for pipeline capacity and for commodity. The LDC only provides distribution services. Finally, a few customers have actually built lines to hook up directly to the pipeline and bypass the LDC altogether. This option is only cost effective for customers who are located quite close to an existing pipeline.

Since 1991, FERC also issued its Order 636. This order further increased competition by authorizing pipelines to sell capacity to any purchasers, allowing resale of pipeline capacity, and prohibiting pipelines from also selling commodity gas. Another important feature of Order 636 was its rate design component. Now, pipelines must sell firm (uninterruptible) capacity at a price that reflects only the cost of serving the customer at its peak contracted demand. Formerly, pipeline capacity charges included a component based on the commodity volumes that the

customer purchased over the course of a year. This rate design makes LDCs and other pipeline customers much more sensitive to peak load.

Natural gas deregulation has had benefits and detriments for Washington customers. Strong benefits include reduced prices for natural gas commodity due to deregulation of prices and increased competition. This deregulation has been directly responsible for the lower gas prices that make gas-fired electricity generation more economically feasible. It has also made LDCs more aware of their options and more interested in pursuing alternative sources of supply. When an LOC faces the "true" cost of peak capacity from a pipeline, it has a greater incentive to pursue ways to reduce its call on pipeline capacity: for example, pursuing load management, liquefied natural gas, and storage facilities. Thus, integrated resource planning for natural gas has largely benefited LDCs by offering a way to identify and evaluate alternatives to traditional resources.

On the down side, LDCs have faced some stranded investment problems when industrial customers have chosen to bypass the system, either partially or entirely. It is difficult for an LDC to plan when it does not know what its future load is going to be. Regulators in Washington state have partly addressed this problem by taking a position on obligation to serve. This position relieves LDCs from the obligation to serve customers who choose to bypass the system. While the short-term stranded investment problem remains, the regulators have partly addressed the difficult problem of long-term planning.

Implications of Structural Changes for Washington State

What do these changes mean for electricity in Washington State and the rest of the country? There are several implications, some will be beneficial, others perhaps not.

Increased Transmission Coordination

One favorable result of increased transmission access is the recognition by energy providers and wholesale consumers in the region that there needs to be greater coordination of the transmission system. Two groups that will undertake coordinated transmission planning, access, and pricing have been formally established—the Western Regional Transmission Association and the Northwest Regional Transmission Association. Members will likely include Northwest utilities, IPPs, and government agencies. As its name implies, the western association would include members from the entire western United States; the Northwest association includes only members located in the Northwestern states and provinces. The Energy Office, the Washington Utilities and Transportation Commission (WUTC), and the Energy Facility Site Evaluation Council (EFSEC) are all eligible for ex officio membership in both associations and expect to participate.

Effects on Cost and Price

Increased competition has already resulted in lower overall costs for energy resources in this state. Regulations require investor-owned utilities to undertake competitive bidding for generation and demand side management resources every two years. Utilities report that they have been able to negotiate contracts for power at a fraction of what they believe it would cost to build traditional resources themselves. In the public sector, a number of utilities have also undertaken competitive bidding for resources, with similar results. Clark County Public Utility District has tentatively agreed to build or purchase the output of a new cogeneration facility that claims to be able to sell power at 30 mills, or 3 cents per kilowatt hour (kWh⁴). Snohomish

County Public Utility District recently received several offers to sell power at prices ranging from 35 to 41 mills. In the short run, it appears that new generators are able to offer power at prices that, if not lower than Bonneville's current preferential farm (PF) rate (27 mills), are certainly competitive with traditional utility-built alternatives.

In the long run, economic theory teaches that competition has the salutary effect of speeding up technological improvements that lower costs and of winnowing out inefficient practices or companies who cannot compete on price over the long haul. The regulatory model of franchised monopolies does not create adequate incentives to improve efficient operations and invest in new technology, because the regulated industry assumes that the regulator will allow cost recovery from ratepayers.

In the retail market, on the other hand, increased competition may or may not lower electric rates to retail customers. A report from Great Britain, which has opened retail markets to competition, indicates that prices industrial customers pay have gone down about 6 percent since retail competition began. The prices that residential customers pay have gone up an average of 6 percent⁵. Some critics of retail wheeling claim that, rather than increasing efficiency, retail competition merely transfers costs from one rate class to another.

Whether retail competition actually lowers overall costs, or merely causes the same costs to shift to different rate classes, will depend on the extent to which the efficiency gains described above offset the potential for stranded investment. This is likely to be a question that will receive a good deal of scrutiny under any proposal to expand retail wheeling in this or any other state.

The extent to which any customer can take advantage of retail competition will probably depend in large part on the amount of influence the customer can exert in the marketplace. Into the near future, individual residential customers are unlikely to have the wherewithal to influence choices concerning alternative sources of power available to them. However, consortiums of consumers, similar to health-care pools, could be created to exert greater market influence than any residential or commercial customer could achieve alone.

Stranded Investment

Some new generating resources are so inexpensive that they currently can be built and operated at a cost approaching the operating cost of some utilities' existing generators. While at first glance this appears to be wholly beneficial to Washington's citizens, it does present some potential problems, including stranded investment. If an IPP can persuade a municipal utility, for example, to purchase its cheaper power, then the utility's current provider - most likely Bonneville in this state - would be "stuck" with the fixed cost of its old power plants. These costs have to be passed along to someone else such as shareholders, another wholesale purchaser, retail customers, or taxpayers.

Stranded investment may be an even bigger problem at the retail level. Indeed, not surprisingly, retail wheeling advocates are most vocal in jurisdictions where utilities need to charge high rates to pay for older expensive plants or even abandoned nuclear plants. In these situations an industrial customer might readily have access to power from a neighboring utility or IPP at a fraction of the current rate from its "own" utility.

One aspect of this stranded investment problem is temporary, because eventually utilities are going to pay off the older expensive plants. Another aspect of stranded investment that exists primarily at the retail level may be more lasting. Under retail competition, utilities could be required to retain at least some obligation to serve customers on demand if a utility is not certain whether a customer who leaves might return, it might have to retain generation and distribution in case the customer does return. Without some sort of exit or reservation fee, these costs would be paid for by existing customers--typically smaller residential and commercial customers. Under the California staff's original proposal, for example, a customer would only need to give one year's notice that it is going to return to its original utility. Generating plants and distribution take several years to build, however, so a year's notice would not be adequate to prepare for a very large customer's return.

The issue of stranded investment is currently the subject of national debate among the electric utility industry, the regulatory community, advocacy groups and others, with many suggestions on how to deal with it.

Economic Consequences

The effects of increased competition are probably largely beneficial to the state of Washington. To the extent competition lowers costs and/or rates; there will be associated benefits of lower cost of living, more jobs, and a healthier economy. The availability of retail competition in Washington would probably not have an impact on the location of industrial facilities, since retail rates in the state are already among the lowest in the country. There could be some shifts between investor-owned and publicly owned utilities, but this would not significantly affect the economy as a whole.

One potential downside to the economy is the effect that customers' threats to leave investor-owned utilities may have on those companies' financial conditions. In California, publication of the CPUC's retail wheeling proposal caused the value of California's utilities' stocks to drop by \$2 .billion during the two-week period following the CPUC's announcement. The utilities also experienced a downgrading of their investment ratings by Standard & Poor's, Moody's, and the Fitch Investor Service ⁶. Typical investors in utility stocks include pension funds and residents with limited or fixed incomes, who need reliable, income-producing investments. For Washington residents who own or rely on income from local investor-owned utility stocks, a drop in value could have a significant effect on their financial stability.

If competition should result in wide scale investment in anyone resource type, those resources would be vulnerable to similar market risks. We are learning this lesson now with our hydroelectric system. Extensive investment in gas-fired generation could keep rate low-if gas prices stay low; Rates could increase significantly if fuel prices increase or government levels carbon or btu-type taxes on fossil fuels. How the region handles resource risk management will figure more prominently under competition, with economic impacts.

Planning More Uncertain

The competitive environment creates planning uncertainties for utilities and others. First, at the wholesale level, predictions of resource costs are currently changing dramatically from month to month. Some IPPs are unwilling or unable to quote firm prices for their fuel costs; contracts may be based on "escalators" or indices whose size is as yet unknown. Planners are faced with the prospect of comparing one resource whose total cost is known -- conservation, for example --

against one whose total cost might vary radically depending on future variable costs. Some planners are developing sophisticated tools to determine how to trade off these uncertainties. These tools may not be available to small, publicly owned utilities that face increased choices in the marketplace.

Load poses the second planning uncertainty. In a regime where retail competition is widespread, utilities have a difficult time knowing how much resource to acquire, and what kind. Where load is uncertain, a utility might be reluctant to invest in resources with high up front capital costs even though they have low life cycle costs. These resources – conservation and renewable - have the highest potential for stranded investment problems down the line.

New Factors in Siting and Transmission

Since IPPs may build generating facilities outside the jurisdiction of regulators or ratepayers, a large number of facilities might possibly be built without a specific purchaser in mind. Several hundred megawatts of capacity that have no long-term contracts for sale are already approved for construction in this region. Over one thousand more megawatts are in the permitting phase.

Who reviews siting applications? The Energy Facility Site Evaluation Council is the major forum for reviewing energy resource siting applications. EFSEC considers the environmental impact of new thermal power plants over 250 MW to determine whether, on balance, a project should be sited. There are two major limitations on EFSEC's jurisdiction. One, facilities under 250MW do not come under EFSEC review. Two, EFSEC is not required to determine whether a proposed facility is needed or is consistent with Washington's Energy Strategy or the region's Power Plan ⁷.

Other than EFSEC, the only review of new energy resource siting occurs at the local level, either through review of the resource decisions of publicly owned utilities, or through a local siting process, or both.

The state's siting laws were written in 1970 to site large coal and nuclear plants. They were not designed to address the types of generation that newer technologies and the effects of deregulation have made possible. Currently no forum in the state undertakes a comprehensive or statewide review of proposed projects to determine whether they are needed or consistent with state and regional energy, environmental and economic goals. A state-appointed committee that reviewed Washington's siting policies and processes in 1993, while agreeing that change was needed, could not reach significant consensus on the form that change should take.

Building generation for export? There is the strong possibility that IPPs will build generating capacity in this state for export elsewhere, particularly California, which has stricter environmental laws for siting and generation than does Washington. This possibility has the benefit of bringing industry to the state, but it also has the drawback of potential adverse environmental impacts and potential strains on the natural gas infrastructure.

More transmission lines? If new generating facilities are sited here, they will require transmission. Under EPACT, utilities cannot refuse to build transmission even if the added transmission does not directly benefit them or their customers. Furthermore, energy providers such as Bonneville are already formulating plans to be both the resource provider and energy transmitter of choice for the region. Conceivably, siting transmission will become even more

controversial than it already is, due to concerns about aesthetics, effects on property value, electromagnetic fields, and other environmental impacts.

Environmental Impacts

Some are concerned about the effects increased competition in general could have on the environment. Both wholesale and retail competition -- even if the retail load is located outside the state -- could promote construction of more low-cost thermal resources such as natural gas-fired combustion turbines. While more environmentally benign than coal plants, natural gas-fueled plants do emit carbon dioxide - the major greenhouse gas - and natural gas is itself a greenhouse gas (methane). Decisions to build or not build natural gas-fired plants affect greenhouse gas emissions. Choices about where to build these plants do not, because effects of carbon dioxide emissions are global not local. However, natural gas-fired plants produce other environmental impacts involving water, visibility, noise, and transmission.

Fish and wildlife protection in Washington state, particularly Bonneville's expenditures in this area, could be affected by increased wholesale and retail competition. If a wholesale customer chooses to take power from a utility other than Bonneville, Bonneville's revenues available for fish and wildlife protection will be reduced. IPPs and competing utilities are not under the same statutory obligations to protect fish and wildlife as Bonneville.

On the other hand, increased availability of alternatives to hydroelectric facilities, such as natural gas-fired turbines, could moderate the economic impact of deratings of the hydroelectric system due to fish protection measures. In the near future, the state may be faced with the difficult task of choosing between two environmental impacts: reduced protection for endangered fish species versus the effects of gas-fired generating resources on air and water quality.

Reliability Impacts

Reliability standards for generation and transmission are currently established by a regional body, the Western Systems Coordinating Council. The WSCC is largely composed of utilities that voluntarily agree to plan and operate their facilities to meet an agreed-upon level of reliability under a range of circumstances. There are concerns that increased wholesale competition would have an adverse effect on reliability because IPPs might not build and operate their facilities in a way that is consistent with regional standards. This concern has partly been allayed by the development of the two regional transmission groups mentioned earlier--the Western Regional Transmission Association and the Northwest Regional Transmission Association. These associations will be open to IPPs and will establish planning and reliability standards for all members. Even if an IPP chooses not to join one of these associations, FERC could very well impose standards upon any power producer seeking transmission, to ensure that reliability standards are not adversely affected. At the retail level there may be more significant risk. A retail customer choosing to take power from an IPP would have no regulatory body for recourse if reliability is not adequate. Recourse would presumably be left to the courts, to interpret the contractual terms of the parties affected. Thus, customers seeking to leave their original utilities and taking power from an unregulated entity would largely be on their own to ensure adequate reliability.

Regulatory Impacts

Increased wholesale competition will probably produce few regulatory impacts: The stage is largely set to have this competition occur. Regulatory impacts at the retail level may be

somewhat different. Two reciprocal regulatory principles are involved. The first principle is the right of a utility to serve all customers in its service territory.

Unlike utilities in many states, Washington utilities do not have a statutory exclusive franchise to serve electric customers. A recent Supreme Court case interpreting similar language in the telecommunications industry held that the WUTC does not have the authority to grant investor-owned utilities exclusive rights to serve particular customers or areas. Furthermore, publicly owned utilities are not subject to any statutes granting them exclusive rights to serve. The allocation of service territories that exists de facto appears to have developed largely as a result of the grassroots origins of public power in Washington and economic practicalities. Theoretically, retail competition could occur at any time.

The second principle, a converse of the right of the utility to serve, is the right of the customer to be served. Here there is language in statute. RCW 80.28.110 provides as follows:

“Every gas company, electrical company or water company, engaged in the sale and distribution of gas, electricity or water, shall, upon reasonable notice, furnish to all persons and corporations who may apply therefore and be reasonably entitled thereto, suitable facilities for furnishing and furnish all available gas, electricity and water as demanded.”

Key qualifiers limiting the obligation to serve are "reasonably entitled to service," and "available gas, electricity and water." In the natural gas arena, the WUTC has interpreted these qualifiers to mean that a utility does not have to maintain facilities to serve customers who choose to bypass their utility and then come back. Presumably, the WUTC could similarly interpret the obligation to serve electric customers.

Another potential regulatory change at the retail level would involve a departure from traditional cost of service regulation. The WUTC has already put into place a mechanism for the telecommunications industry that establishes "incentive based regulation." Under this arrangement, the rates that the telephone companies may charge are indexed to independent indices and indices of performance. As already noted, the California commission is considering similar regulatory changes for the electricity industry.

In a sense, such a mechanism already exists in Washington state. Puget Sound Power and Light has had a mechanism in place for about three years that ties annual rate changes to changes in the number of customers it serves. (The 1991 Biennial Report discussed the mechanism briefly when it was still in the proposal stage.) The purpose of the mechanism is to free Puget from dependence on sales levels to meet its earning needs. This is a limited departure from cost-based regulation, which has been widely praised in this state and elsewhere.

Conclusions

This section has identified a number of beneficial impacts of structural changes to wholesale and retail electric markets. It has also provided some warnings concerning potential drawbacks. Collectively, this information points to four key conclusions:

Siting laws and processes must benefit the public by balancing the needs of development, utilities and environmental interest.

Energy facility siting statutes, adopted in the early 1970s, no longer meet the needs of a vastly changed utility industry, nor do they reflect the energy goals of the state of Washington in how

we should meet future need. Washington's facility siting statutes and processes must be revised to ensure that all energy resources are evaluated on an equal basis and that proposed facilities, regardless of the jurisdiction in which they are proposed, are considered in a consistent manner. The revised statutes must, however, retain provisions for one-stop permitting and the availability of an expedited review.

Structural changes in the electric industry could adversely affect integrated resource planning.

One of the key concepts of integrated resource planning is its long-term focus. Utilities are required to select resources that have the lowest cost over a relatively long period-20 years in Washington. Restructuring in the electric utility industry has the potential to adversely affect integrated resource planning by refocusing attention on the short term. One, utilities may be reluctant to invest in cost effective, but capital intensive resources such as demand side management and renewable resources. Reluctance may spring from the uncertainty over retail load, as well as a desire to stay competitive with wholesale providers in the short term. Two, retail wheeling opportunities make it less likely that a centralized planning body, such as a utility, will undertake a comprehensive review of all possible resources available and select those that have the most benefit to Washington's citizens over the long term.

While these reactions are a natural response to competitive pressure that many utilities are feeling, jeopardizing integrated resource planning principles in order to respond to short-term competitive pressures does not protect Washington's interests. The state can take a number of steps to protect the advances made in integrated resource planning and acquisition. These steps include using need and consistency as criteria for siting new facilities; examining retail access proposals to ensure they do not adversely affect utilities' ability to conduct integrated resource planning; requiring that all utilities do integrated resource planning (not just investor-owned utilities); and providing incentives to utilities for conducting integrated resource planning.

There is no pressing need to encourage or even establish retail access as a feature of the electricity structure in Washington state.

In Washington, retail access appears to be legally available already. The fact that it has not occurred suggests that one utility's retail rates do not provide enough of a cost advantage over another's to *justify* switching. There are no strong proponents of retail access in Washington state at this time. While retail wheeling arguably could reduce rates, it might simply transfer costs. Some argue that customers with market power (i.e., large industrial customers) could benefit under retail wheeling while customers with less power (i.e., residential customers) could lose. Retail wheeling, experiments will likely be taking place around the country for the next several years. Washington state could take advantage of these experiments to find out whether some form of retail access would be in the interest of Washington's residents. The state can afford to continue to monitor developments in other states to determine the extent to which it should encourage or facilitate retail access here.

There appear to be asymmetries between Washington utilities' obligation to serve and their "right" to serve certain customers.

There is currently no statutory right to serve particular customers or particular areas. However, utilities have the obligation to serve customers requesting service if the request is reasonable, and the facilities are available. If this statute is interpreted to mean that a utility does not have to

build and maintain facilities for former customers who may later want to return, the problem of stranded investment becomes less acute. However, if Washington's customers want to have unlimited ability to come and go, with remaining customers picking up the cost of maintaining unused facilities for them, these asymmetrical rights and obligations could have the undesired effect of placing all the risks of load changes onto utilities and none onto the departing, customers.

End Notes

1:1 A combined cycle power plant uses combustion turbine generators, heat recovery steam generators, and a steam turbine-generator to produce electricity. Natural gas (or oil) is fired in the combustion turbine generator. These gases are then passed through the steam generator to produce steam for the steam turbine.

1:2 Energy Information Administration, "*The Changing Structure of the Electric Power Industry*" 1970-1991. [1993] EIA Report #DOEIEW0562.

1:3 Some large industrial customers have generated their own electricity through cogeneration or hydroelectric facilities dedicated to their use. In the Northwest, 10 large industrial customers take their power from the Bonneville Power Administration rather than local utilities.

1:4 Written comments from the Energy Office to Bonneville noted that this figure "must be viewed with skepticism, since to the best of our knowledge, it is not yet backed up by a fuel contract or Canadian gas export license." Nevertheless, this extraordinarily low price demonstrates the level of competitiveness fostered by the new era of wholesale competition.

1:5 Alex Henney, Challenging the Status Quo: Privatizing Electricity in England and Wales, *Public Utilities Fortnightly*, July 15, 1994, p. 26.

1:6 "Analysis put California Utilities on Alert, Market Values Plummet," *Electric Power Alert*, May 25, 1994, Vol. IV No. 11, p. 11.

1:7 Washington's Energy Strategy is independent of fuel choice while the region's Power Plan focuses on electricity alone. EFSEC's jurisdiction extends to pipelines and certain transmission lines as well as large electricity generating plants.

Section 2

New Era for the Bonneville Power Administration

Competitive pressures in the electricity industry are bringing sweeping and rapid changes to the Bonneville Power Administration: These changes are happening so fast that some of the following information may be incorrect by the time readers receive this report.

Bonneville Challenges: Implications for Washington State

Bonneville plays a major role in the electric energy field for the entire Northwest region. Along with other federal agencies, Bonneville supervises operation of the federal hydropower system on the Snake and Columbia rivers. It markets this power to publicly owned utilities, certain very large industrial customers, and privately owned utilities in the region. In addition, Bonneville sells power to utilities located outside the region, primarily on a non-farm basis.² Bonneville also owns and operates about 80 percent of the transmission facilities located in the Northwest. It uses this system both to transmit power it markets and also to transmit power generated by others.

Under the Northwest Power Act, Bonneville must ensure that operation of federally owned hydroelectric facilities is consistent with objectives to protect fish and wildlife in the Columbia River Basin. Electricity from new resources marketed by Bonneville must also be consistent with resources identified in the region's Power Plan and required by the Power Act.

Like virtually all utilities in the country; Bonneville is feeling the pressures brought on by increased competition in wholesale and retail markets. Bonneville faces additional pressures, however, due to its statutory responsibilities under the Northwest Power Act. These challenges include:

National Energy Policy Act of 1992 (EPACT)

EPACT broadens the categories of generators who are exempt from federal regulation as utilities, thereby increasing the competitive pressure from other generators. Perhaps more significantly, EPACT (§ 721) requires Bonneville to make its transmission facilities available to anyone testing transmission, and even to build new transmission upon request³. This requirement could significantly erode Bonneville's 80-percent control on the regional transmission system. New pricing policies at FERC, in response to EPACT's directives, make it clear that utilities must offer "comparability." In other words, they must offer transmission to requesters at the same rate and under the same terms as the price of transmission for their wholesale transactions.

Bonneville's customers in the Northwest are demanding that Bonneville provide comparability for its transmission services. Some transmission owners are concerned about comparability requirements because, traditionally; ownership of transmission lines has created a major opportunity for making priced wholesale power sales more competitive. With comparability; all power essentially transmits at the same price. If Bonneville offers full comparability; it will lose any opportunity to use transmission prices to make its power more attractive than its competitors' power.

Falling Gas Prices

As the price of gas-fired generation falls, gas becomes a more realistic competitor to Bonneville's inexpensive hydro resources. While the Energy Office and others believe that Bonneville still retains a price advantage over natural gas competition, the gap is certainly narrowing. The gap is narrowing due to falling gas prices and increases in hydropower costs from fish and wildlife programs. If gas-fired generation becomes a competitive alternative to Bonneville's hydroelectric resources, Bonneville may lose significant loads. This would result in lost revenues that may have to be recovered from remaining customers. (Section 1 discussed this issue of stranded investment in greater detail.)

Fish and Wildlife Responsibilities

How Bonneville manages the hydroelectric resources in the basin must take into account the requirements of the Power Council's Fish and Wildlife program. Bonneville states in its Draft Business Plan that its expenditures for fish and wildlife measures have grown from \$20 million in 1981 to \$350 million in 1994. These costs include lost revenues from operating dams in a manner that foregoes revenues from hydroelectric sales. Although some have challenged the accuracy of the \$350 million figure because it also reflects the cost of recent droughts, Bonneville unquestionably expends substantial amounts on fish and wildlife. It is not clear yet how two recent federal court decisions will affect Bonneville's program costs and revenues from hydroelectric facilities. Some have speculated that the impact on the percentage rate could run in the double digits.

Controversy on the Columbia: The Future of Salmon

Washington's energy future is tightly linked to the future of salmon stocks in the Columbia River. In 1992, hydropower facilities on the Columbia River generated over 8,800 aMW of electricity valued at over \$2.2 billion. These facilities provide half of the electricity used in the region, at costs considerably less than other generation alternatives.

This low-cost energy resource comes with a price. Columbia River salmon runs have declined precipitously, from somewhere between 1 ° and 16 million in the 1800s, to 550,000 adult salmon two years ago. Of the adult salmon that returned to the Columbia Basin in 1993, less than 200,000 came from wild stocks.

The causes of the decline of salmon populations are complex. They include:

- Driftnet fishing on the high seas;
- Over harvesting in the commercial and sports fisheries offshore and on the river;
- Damage to spawning habitat due to forestry, agriculture, and urban development;
- Weakened wild salmon stocks from competing and interbreeding with hatchery-produced fish;
- Obstacles to fish passage posed by the dams, and
- Drought and the effects of ocean warming (El Niño).

While no consensus exists on which causes produce the largest impact, the Columbia Basin dams clearly contribute to the problem. Spawning salmon must run a gauntlet of fish ladders. Impassable dams completely block the upper Columbia portions of the Snake River and several tributaries. Juvenile salmon that would have been carried to the sea by swift-flowing rivers must now navigate an obstacle course-turbines and slow-moving water in reservoirs filled with predators. All take their toll.

Consensus on which measures would most effectively mitigate the dams' effects has not developed either. The environmental community and tribes support drawing down reservoirs and flushing the juvenile salmon. Those who rely on the river for irrigation or power generation argue for building on existing mitigation efforts. These efforts include retrofitting more dams with fish screens or expanding efforts to transport fish around the dams by truck or barge. Others argue for more attention to limiting harvests and protecting habitat.

NMFS and the Courts Intervene

Since 1991, the National Marine Fisheries Service (NMFS) has placed the Snake Sockeye, two species of Snake Chinook, and the Kootenai white sturgeon on the endangered species list. NMFS has received nine additional petitions for endangered species listings in the last 15 months. In addition, NMFS announced last September a new initiative to engage in a comprehensive status review of all salmon and anadromous trout populations in the region. The initiative intends to determine whether a population constitutes a separate species, and if so, whether that species is threatened or endangered.

The Endangered Species Act requires the NMFS to develop recovery plans for listed species, with input from the Power Council and federal, state, and tribal management agencies. Under the Northwest Power Act, the Power Council is also charged with developing a basin-wide salmon management plan covering all species. This plan provides guidance for NMFS' recovery plans.

Meanwhile, two recent court decisions have made it clear that important non-energy interests must be considered, even more than previously, in deciding how to operate hydroelectric facilities and protect fish and wildlife in the region. In the first decision, *Idaho Department of Fish and Game v. National Marine Fisheries Service*, U.S. District Court Judge Malcolm Marsh sent federal agencies back to the drawing boards on their 1993 plan to manage the hydro resources to protect salmon. Judge Marsh ruled that the agencies had used flawed data to reach a finding that the proposed operating criteria would not jeopardize the survival of endangered salmon. While the decision came too late to affect 1993 operations of the river, the principles articulated in the decision are governing for future river operations.

In the second decision, *NRIC v. Northwest Power Planning Council*, the Ninth Circuit Court of Appeals rejected the Power Council's strategy for salmon, finding that the council had not adequately considered all alternatives before it. While not technically binding, some language in the opinion has led the Power Council and others to believe that the Court will require substantially more deference to fish and wildlife interests than the council has given them in the past.

The Region Responds

Preserving wild salmon fisheries and fishery habitat is a high priority for the Governor's Office.

The Governor established a cabinet-level group that will monitor the state's ability to respond to the urgent need to protect these resources and coordinate and accelerate state agencies' efforts to preserve fishery habitat.

The most recent drafts of the Snake River Salmon Recovery Plan (December 1994) are expected to place much more emphasis on managing the hydro system to support fish and wildlife. In addition, on December 14, 1994, the Power Council, by a vote of 6 to 2, adopted measures that will significantly impact hydropower production. These most recent actions are expected to reduce annual hydropower production by 525 aMW. The Power Council is considering options that could reduce production by another 325 aMW. These are in addition to 390 aMW of reduced production from the original water budget for fish (1982), and the Power Council's Strategy for Salmon (1992).

Clearly, salmon preservation efforts will be costly. Bonneville's fish and wildlife expenditures have already escalated since 1983. The Power Council estimates that the newest measures will cost Bonneville \$1 77 million each year in lost revenues and other costs, and result in a 9 percent increase in Bonneville's wholesale utility rates through the year 2015.

Events are moving rapidly. Several factors, including future court action, lawsuits, and possible changes to the Endangered Species Act, could dramatically alter the picture.

Conservation Goals

The region's Power Plan aims to achieve about 1500 average megawatts (aMW)⁴ of efficiency and conservation resources by the year 2010. The Power Council based this goal on a combination of economic and environmental considerations that reflected the dual objectives of the Power Act. Although the region's Power Plan did not strictly allocate responsibility for acquiring particular resources to individual utilities or to Bonneville, Bonneville has committed to achieve, among itself and its customers, all cost-effective conservation by the year 2003. Bonneville currently estimates that the "share" of the 1500 aMW goal for which it and its customers are responsible is about 660 aMW.

Although conservation competes directly on a cost basis with supply-side resources, conservation acquisition by Bonneville places competitive pressures on that agency for at least two reasons. First, efficiency is highly first-cost intensive: although in the long run it may cost less than other resources, virtually all of the costs are paid up front. Second, large-scale efficiency programs place upward pressure on power rates because fixed costs have to be spread over fewer kilowatt-hours. In addition, acquisition can be more complex and administratively burdensome for a central authority when that authority needs to gather in small, individual conservation resources scattered over a large geographic area. Some critics of Bonneville's conservation program believe that conservation should be acquired and funded directly by individual utilities that are more familiar with their customers and may be able to achieve cost savings that Bonneville cannot achieve.

Bonneville's Response to Competition: The Draft Business Plan

As early as mid-1993, Bonneville's management began developing responses to the competitive

challenge it perceived. Through a series of initiatives, discussions with regional stakeholders, and introspection, Bonneville developed a mechanism for responding to its perceptions: a draft business plan. The Energy Office sees three main goals of the Draft Business Plan. They are: improve efficiency and cut costs; ensure stability of revenues through structural changes in rates; and transfer Bonneville's "share" of the regional obligation for conservation acquisition to its customers.

The Business Plan included several elements that have major impacts on Washington's energy future. These include:

- Major improvements in efficiency of operations, resulting in overall cost reductions for Bonneville;
- Substantially reducing centrally funded and operated conservation programs, and instead providing incentives and mechanisms for Bonneville's customers to fund and operate programs on their own;
- "Reinventing" fish and wildlife programs to achieve regional efficiencies; and
- Introducing legislation to turn Bonneville into a government corporation, freeing Bonneville from some federal personnel and procurement requirements and reducing federal oversight of Bonneville's activities.

The Energy Office agrees with many portions of the Draft Business Plan. In filed comments on the plan that were forwarded by Governor Lowry, the Energy Office, along with other state agencies, lauded Bonneville's commitment to cut costs and increase efficiency.⁵ The Energy Office supported Bonneville's attempt to remain competitive with other options available to its customers, as well as its proposals to streamline and achieve administrative efficiency. The Energy Office also commended Bonneville's decision to increase the variety of energy services it offers, tailor them to meet customers' specific needs, and structure its rates so that incremental resources are priced at incremental cost.

At the same time, the Energy Office had a number of concerns about portions of the Draft Business Plan. In particular, the agency questioned some of the assumptions contained in Bonneville's analysis of conservation spending and potential, its competitiveness, and some of the specifics of Bonneville's proposed rate structures.

The Energy Office expects to participate actively in a number of forums as Bonneville's response to new market forces continues to evolve. They include negotiations underway between Bonneville and its customers for new sales contracts; and Bonneville's participation in regional transmission groups that are expected to determine the transmission need, access, and pricing for Bonneville and most other utilities in the western United States. Other forums include those to define the extent and nature of Bonneville's own conservation programs and to monitor the success of Bonneville's customers in acquiring efficiency resources on their own.

Conclusions

It is a state priority to ensure that Bonneville's actions are consistent with fish and wildlife objectives of the Northwest Power Act, as well as the Endangered Species Act.

Protecting the state's fish and wildlife resources remains a state priority. The Governor has established a cabinet-level group that will monitor the state's ability to respond to the urgent need

to protect these resources. The Energy Office will participate on this group. Its mandate here is to see that Bonneville's and other electric utilities' stewardship of hydroelectric resources continues to reflect the goals set forth in federal and state law regarding fish and wildlife protection.

The Energy Office and others have been working with Bonneville to ensure that its new initiatives, such as the Draft Business Plan and power sales contract negotiations, affirm Bonneville's power responsibilities under the Northwest Power Act.

The Power Act requires Bonneville to acquire resources consistent with the mandates of the Northwest Power Plan, which grants priority status to efficiency, renewables and high-efficiency generation. In its Draft Business Plan, Bonneville concludes that competitive pressures force it to scale back its own acquisition of these resources. Bonneville argues that unless it can respond to competition, utilities and others will acquire resources inconsistent with the Northwest Power Act.

The Energy Office will continue to work with Bonneville to fashion a strategy that preserves Bonneville's competitiveness and remains committed to the goals of the Power Act and the mandates of the Power Plan.

The Energy Office is working with Bonneville and others to ensure that the goals of regionalism embodied in the Northwest Power Act remain intact.

The Power Act established an important principle: the Northwest would benefit from regional planning and, to a certain extent, from regional management and acquisition of new resources. Competitive pressures, on the wholesale and retail levels, could potentially disrupt the regionalism that has characterized resource acquisition for the past 14 years. The Energy Office believes, however, that decentralized acquisition of resources need not result in loss of regional benefits and regional planning.

One beneficial development of increased competition at the generation level has been the growing recognition of a need to plan regionally to ensure at least system-wide transmission efficiency. A large number of utilities, independent power producers and regulators in the western United States have formed regional transmission associations. These associations commit members to plan regionally, share information, and resolve disputes through arbitration. In some cases, they may also attempt to develop prices for transmission. The Energy Office will participate as an ex officio member of these associations.

The Energy Office also believes that competition, at least at the wholesale level, can lead to greater efficiency, so long as the price to the purchaser reflects the cost of the various alternatives. The Energy Office will work with regional decision makers to develop mechanisms for pricing and acquisition that allow for the benefits of competition without undue impacts on equity.

It is a state priority to keep the Bonneville Power Administration a low cost supplier of power and power services to public and private electric utilities.

Washington's economy has been built on inexpensive electric power, primarily from Columbia Basin dams. Bonneville's low rates have spurred the Northwest economy for decades. WSEO is determined to help Bonneville keep its rates low; and has strongly supported the agency's efforts to cut administrative costs, to redesign its rate structure to send better price signals, unbundle its products and services to provide customers with more options and to add value to the products and services it provides. The Energy Office believes such actions are wise with or without a

more competitive industry.

End Notes

2:1 Interested parties should contact the Washington State Energy Office to be sure of the latest information.

2:2 Non-firm power is power sold to utilities and others when and if it is available. This is in contrast to firm power, where Bonneville commits to finding enough resources to make the power available to the customer. Under federal law, Bonneville is not allowed to make long-term firm sales outside the Northwest region.

2:3 Generators can require new transmission be built, but they must also pay for it.

2:4 An average megawatt is a unit of energy representing 8,760 megawatt hours, or one megawatt hour for each hour of the year.

2:5 Copies of the Energy Office's comments are available from the agency on request.

Section 3

Plutonium Disposition

The National Academy of Sciences has identified three "preferred" methods of disposal for weapons grade plutonium. In two of them, burning in reactors and vitrification, Washington state could figure prominently.

Background

Both the United States and the former Soviet Union agreed under the START treaty to dismantle a sizable portion of each country's nuclear arsenal. In the process, plutonium pits - metal balls of plutonium-are removed from warheads. Once they are removed, the question is how to dispose of them.

The National Academy of Sciences sought a solution that would render the material virtually useless for redeployment in weapons and selected what the Academy termed a "spent fuel" standard ¹. Under this standard, final disposition would have to be in a form that was at least as difficult to reconvert back into weapons grade material as is commercial spent nuclear fuel. This criterion effectively eliminates long-term monitored storage because a simple policy reversal could redeploy the pits. The Academy has identified two preferred methods that might involve Washington - burning in reactors and vitrification.

Burning plutonium in reactors meets the standard by mingling the plutonium with commercial reactor waste, a difficult-to-handle radioactive material requiring sophisticated technology to re-extract plutonium. The plutonium would then be disposed of with the normal stream of commercial nuclear waste. Such burning is a proved technology, already engineered into many reactor designs on the assumption they might one day burn plutonium from breeder reactors. ²

The second alternative, vitrification, reduces plutonium to powder then mixes it with other radioactive wastes to create glass bars that resist erosion and extraction. The vitrified material would be disposed of in a deep-storage repository now planned for Nevada, along with other waste materials destined there from U.S. weapons production facilities. While vitrification is also a proved technology, some issues have yet to be resolved. They include criticality ³ in the melter and, over the long-term, in the repository.

The U.S. Department of Energy is preparing a draft Environmental Impact Statement on the alternatives, due in the fall of 1995. A final Record of Decisions is expected by the spring of 1996.

Why Washington State?

With either burning or vitrification, Washington offers a comparatively low-cost solution. If plutonium is to be burned, it must first be mixed with uranium and manufactured into commercial reactor fuel rods. An expensive, preferably isolated plant is required. The Hanford reservation in Eastern Washington contains an unfinished laboratory that could be readily converted for this purpose. ⁴ A duplicate laboratory could be constructed elsewhere such as at

Pantex, Texas, where the pits are stored, but at a greater cost.

Hanford is also one of only two sites where, a vitrification plant is already planned. At Hanford and at Savannah River, Georgia, the U.S. Department of Energy plans to vitrify tens of millions of gallons of radioactive waste from weapons production. A third facility could be built, but at additional cost. While use of Hanford facilities may represent a cost-effective solution, it would mean weapons grade plutonium must be transported from Pantex, Texas, to Washington, and out again as waste.

Supply System Makes an Offer

The Washington Public Power Supply System (Supply System) recognized that the lab at Hanford was a logical site for fuel fabrication. The Supply System has volunteered to modify an existing reactor (WNP-2) and to complete construction of a second reactor (WNP-1) to burn plutonium. Both reactors are on the reservation less than five miles from the lab. The Supply System has proposed that both reactors remain Supply System units under the oversight of the Nuclear Regulatory Commission.⁵ The Department of Energy would provide the fuel and guarantee a price and a market for the electricity.

Up to 100 metric tons of weapons grade plutonium are planned for disposal; a similar amount is being collected in Russia. A single reactor can "burn" up to two tons a year. It would take 25 years, once reactors and fuel are ready, to "dispose" of the plutonium under the Supply System proposal. Use of additional reactors could reduce the disposal time significantly.

A similar proposal called the Isaiah Project would complete WNP-1 at Hanford and WNP-3 at Satsop for the same purpose. Elements of the Isaiah proposal are different and include a financing mechanism to subsidize a parallel effort in the former Soviet Union. To date, only the Supply System and proponents of the Isaiah Project have volunteered facilities for plutonium burning.

To implement either one of these proposals, one or two mothballed nuclear plants in Washington state would have to be completed. Funding to preserve the plants at Hanford (WNP-1) and Satsop (WNP-3) was terminated by the Supply System's board last spring. No arrangements have been made to continue preservation funding past January 13, 1995. Recently, Hazel O'Leary, Secretary of the U.S. Department of Energy, indicated that her department had no funding available to preserve reactors considered for burning plutonium. The Supply System may find resources to preserve WNP-1, which is part of their proposal, but will likely seek no additional preservation dollars for WNP-3.

Connection to Energy

Issues of national security, rather than energy, will drive the decision about plutonium disposal. The United States needs to demonstrate effective and timely disarmament-use of reactors is incidental to the goal. Furthermore, the White House and the State Department will have as much to say about plutonium disposition as the Department of Energy. Here in the Northwest, additional generating resources east of the Cascades are not needed, especially expensive nuclear plants. That sentiment could change as decisions involving endangered salmon species continue to derate the hydropower system. Even then a nuclear plant would not be the cost-effective

option. The federal government would have to subsidize completion and operation of such a plant before it could become a valuable and complementary generating resource for the Pacific Northwest.

The Clinton Administration expects a decision on a preferred disposal method by the summer of 1996. It is possible that a specific alternative, such as the Supply System's proposal, could be selected at the same time. Governor Lowry has said that the state will reject any alternative that includes completion of the Satsop plant on Washington's coast. He has also said that any Hanford alternatives must not interrupt or diminish ongoing Cleanup of weapons production facilities and wastes at Hanford. He adds however, "...that we have no greater obligation in this century than to ensure that surplus plutonium is never again used in nuclear arms...", and, "...We are willing to do our part to make this a safer world." Governor Lowry has stated that Washington will do its part if necessary, but only if four conditions are met: Hanford cleanup is not adversely affected; all citizens in some way share the burden of disposition; all reasonable alternatives are considered; and the process is characterized by broad, respectful, open, deliberate, and early public participation.⁶

Conclusions

While these issues are primarily waste issues, and therefore the responsibility of the Washington State Department of Ecology, the Washington State Energy Office needs to work with Department of Ecology to continue to monitor U.S. Department of Energy's determinations regarding plutonium disposal. The responsibility of the state's Energy Office is to ensure that any energy issues that arise are correctly articulated and appropriately addressed. Key energy issues concern how such a plant would enhance or diminish safety and reliability of the regional transmission grid, how state energy facility siting and monitoring laws would apply, and whether inappropriate costs might be placed on Washington state's utility ratepayers.

End Notes

3:1 National Academy of Sciences, Committee on International Security and Arms Control, *Management and Disposition of Excess Weapons Plutonium*, National Academy Press, 1994, p.148.

3:2 All reactors in Washington, complete or mothballed, have this capability.

3:3 At certain masses and temperatures plutonium "goes critical," that is, it explodes.

3:4 The Fuel Materials Examination Facility, originally constructed to convert isotopes from the experimental Fast Flux Production Reactor, also on the Hanford reservation, is-now being terminated.

3:5 Reactors operated by the Department of Energy are not bound by the regulatory oversight of the NRC. Historically they have operated in secret and today constitute several of the nation's worst environmental sites.

3:6 Office of the Governor, Washington state, *Comments of Governor Mike Lowry on the Storage and Disposition of Weapon-Usable Fissile Materials*, Richland WA, August 31, 1994.

Section 4

Energy Emergencies

Supply shortages or disruptions can ultimately affect every person and every economic sector in the state. The ability to anticipate supply shortages, and respond appropriately to supply disruptions can help mitigate the severity of emergencies.

Prevention and Response

Safe and reliable supplies of energy underpin essential services such as heating, lighting, refrigeration, transportation, and communications. Energy emergencies—supply shortages or disruptions can be extraordinarily devastating. They have economic consequences; and they can threaten lives and property.¹

Prevention provides the first line of defense. Energy distribution companies design strong and redundant systems to guard against failures. But failures will occur, and contingency plans are needed to address a full range of emergency situations – from the economically inconvenient to major disasters.

Energy suppliers handle most emergencies, with the state providing assistance as needed. In more severe emergencies the state plays a larger role. During a major catastrophe, for example, the Department of Community, Trade, and Economic Development (DCTED), coordinates all public and private response efforts including any interaction with federal agencies.

The Washington State Energy Office assists utilities in whatever way possible during localized outages and works with other state agencies when the state responds to disasters. By statute, the Energy Office is responsible for coordinating a response to petroleum and electricity supply shortages and for administering the Governor's energy emergency powers (RCW 43.21F and G).

Types of Emergencies

Washington's energy systems are vulnerable to two types of emergencies: *acute system failures*, usually caused by accidents or severe weather, and *supply shortages*.

Acute System Failures

All energy delivery systems are vulnerable to accidents and disasters. However, petroleum and natural gas disruptions are quite rare and tend to have economic rather than life-threatening consequences. Exceptions include a major disaster or the immediate vicinity of an accident. Electricity system failures are more common and more serious.²

Acute electrical system failures usually result from storms or accidents that damage facilities and equipment. When this happens, the supply of energy cannot reach users until the damage has been repaired and service restored. The inauguration day windstorm in '93 caused the most recent large-scale electric power outage in Washington. Within a few hours, the storm knocked down thousands of power poles and wires. Almost a million customers were without power at

the height of the storm, and some went a week or more before service was restored. Unseasonably warm temperatures saved the state from a much more serious emergency.

In response, numerous state agencies gathered under the direction of DCTED to assist utilities, businesses, citizens, and local governments. The Energy Office communicated with utilities to develop a damage assessment and to calculate the nature, extent, location, and possible duration of the power outage. The Energy Office acted as liaison between utilities and other agencies and was able to facilitate several response activities:

- Notifying utilities of key communications facilities.
- Waiving load restrictions on out-of-state electric utility repair trucks.
- Attempting to transport critical equipment to remote utility stations using helicopters from the state Military Department.
- Coordinating utilities with the Red Cross to determine appropriate shelter locations.

Supply Shortages

Energy supply shortages can also result from accidents or disasters. For example, the Exxon Valdez oil spill led to a temporary shortage of diesel fuel in Eastern Washington. Localized shortages developed when customers or distributors made unusually large purchases because they anticipated higher prices. This exceptional demand outstripped the distribution system's ability to respond.

Energy shortages normally result from a broader set of causes. For example, war in the Persian Gulf might have created a severe worldwide shortage of oil. Drought in the Northwest could set the stage for insufficient winter supplies of electricity. Because shortages have different causes than acute system failures, they require a different response. Demand needs to be restrained to meet available supply until supply can be increased. Repairing facilities usually does not factor into the response.³

Unlike most acute system failures, addressing significant energy shortages requires substantial state involvement. Efforts center on getting the public to respond correctly by reducing energy consumption. State leadership in raising public awareness and educating consumers is critical.

Allocating scarce energy supplies to ensure that essential service providers have fuel may also be required. Because allocation can be quite contentious, it requires state leadership to ensure effective and equitable distribution. In the case of extreme shortages, some rather demanding steps may have to be taken--such as waiving environmental restrictions on certain types of energy use. This can only be done under the guidance and authority of the Governor's emergency powers.

Response for Petroleum Shortages. The major impact of most petroleum shortages is economic--prices rise to reflect limited supplies. Steep or rapid rises in price can cause a variety of economic problems. They adversely affect people with low or fixed incomes. Businesses that depend heavily on transportation may be threatened by the increased cost of doing business. Furthermore, if a shortage is very extreme, pricing alone cannot guarantee sufficient fuel to essential service providers.

Within two weeks after Iraq invaded Kuwait, gasoline prices rose 20 percent in Washington.

When the Iraqi army collapsed, prices returned to pre-war levels and a shortage was averted. Prices during an actual shortage could have gone much higher.

In the months preceding the Persian Gulf war the Energy Office prepared the state for the possibility of a major oil shortage. Efforts concentrated on public education and the preparedness of state agencies, local governments, essential service providers, and transit agencies. Arrangements were made with oil companies for responding to critical needs and administering fuel allocations in case such steps were necessary.

This "exercise" revealed strengths and weaknesses in the state's existing Petroleum Products Contingency Plan. The plan requires serious updating, which will take place in the coming biennium. At the same time, the Energy Office plans to revise its administrative role for dealing with petroleum emergencies, to reflect changes in the industry, in federal regulations, and in policies for addressing petroleum shortages.

Regional Electricity Shortages. One type of electricity shortage is the inability to meet daily peak demand. The Northwest's vast hydroelectric system historically has provided a peaking capacity far beyond Washington's daily needs. However, some areas of the state, notably the Puget Sound region, are beginning to experience occasional difficulty meeting *daily* peak demand. This emerging problem results from transmission constraints and bottlenecks, not insufficient generation, and is being addressed by the utility industry.

Electricity systems also have *seasonal* peaks—Washington's comes in the winter when demand for heating increases. Over the last few years a reduction in generating capacity and increasing demand have seriously tested the region's ability to meet winter energy loads. Even so, the region is unlikely to experience an electricity shortage as a direct result of seasonal peaks. Utilities can see a shortage coming by monitoring reservoir levels and weather. As fall and winter progress, utilities can work to avert such a shortage by reducing "drawing down" of reservoirs and purchasing more energy from out of state. The result is higher energy costs, but no winter shortage. By taking such steps a shortage can be averted, or at least reduced in severity. Because of low reservoirs, the Bonneville Power Administration had already paid an extra \$87 million by the end of 1994 for power purchases needed in the fall and winter. With continued cold weather, that amount will surely increase. The cold winter of 1991, for example, cost the region an additional \$250 million.

A cursory analysis performed by the Bonneville Power Administration in 1992 estimated that, even in the worst water years and with extremely cold weather, most shortages could be handled with a minimal voluntary effort. Years of drought and cold weather are those where such a shortage is most likely. Unfortunately, Washington has experienced drought in seven of the last eight years. Utilities are now operating reservoirs in a manner designed to avert a regional energy shortage.

If such a shortage occurs, it will be regional in nature. Washington, Oregon, Idaho, and western Montana have a single, large transmission grid. The grid is connected to other regions through large interties extending north, east, and south. Within the grid, electrons do not recognize state borders. If there ever is insufficient energy to meet load on the grid, all four states will face the same shortage. Recognizing the regional nature of electricity supplies, the four states have adopted a regional approach for managing a shortage.

Over a three-year period, the Northwest's electric utilities, public utility commissions and energy offices worked together to update the Regional Curtailment Plan for Electric Energy. The four states used the regional plan as a model and adopted similar state plans. In November 1994, the Energy Office, after a one-year consultation process with state utilities, adopted the Washington State Curtailment Plan for Electric Energy as an administrative role (WAC 194-22).

The plan calls for the four Northwest states to initiate curtailment actions jointly. Washington's plan emphasizes voluntary curtailment and equal curtailment requirements for residential, commercial, and industrial customers. The plan has five stages; each stage represents a more severe shortage that requires sterner steps. The first two stages are voluntary. The final three stages are mandatory. Consuming sectors are treated equally until stage four, where greater requirements to reduce consumption are placed on commercial and industrial customers. State law requires that such emergencies be implemented by the Energy Office under the guidance and direction of the Governor's Office. Under the most severe emergencies, an emergency legislative committee is convened and the Governor's emergency powers activated (RCW 45.21G).

Conclusions

The safety and welfare of Washington's residents are occasionally threatened by energy emergencies. Preparedness and speedy, correct responses can minimize these threats. Being prepared requires maintenance of a response program to ensure contacts are current, response personnel are properly trained, and response plans work well within evolving energy markets and infrastructure. The Energy Office lends expertise as needed to mitigate the effects of acute system failures and fulfills its statutory responsibility to administer contingency plans for major petroleum and electricity shortages.

End Notes

4:1 Electricity emergencies have the greatest potential for causing loss of life and affecting health and safety. Unlike oil and gas emergencies, where electricity can be used to provide heat, the loss of electricity shuts off all heating systems that require ignition or fans. Electricity emergencies also affect lighting, water and sewer processing and pumping services, food processing and pumping services, food processing, refrigeration, communications, life support systems, security systems, banking and bankcard services, even gasoline pumping.

4:2 With increasing reliance on natural gas-fired electricity generation there will be more potential for combined natural gas/electricity emergencies. During very cold weather there could be strong demand for natural gas for both heating and electricity generation. Currently, Washington's natural gas infrastructure is sufficient to meet even extraordinary demand. As demand increases, the infrastructure will have to expand.

4:3 While Washington usually faces only one type of emergency at a time, there are conditions where supply shortages and system failures merge. For example, during some years the region may have fairly thin margins of electricity supply available - reservoirs are low, the winter is cold, all generators are operating, the interties are filled to capacity. Loss of a generating plant due to an accident could throw the region into insufficiency. While the plant was under repair, the region would either have to reduce load immediately or draw down reservoirs, which would necessitate curtailment in the near future.

Section 5

Washington's Energy Strategy

The Strategy provides an organized framework to guide Washington's decisions into the next century. Its recommendations rely on known cost-effective technologies and approaches, beginning with improved efficiency, renewable resources, and wise use of natural gas.

Background

In January 1993, The Washington Energy Strategy Committee presented to the Legislature a comprehensive energy strategy for Washington State. *Washington's Energy Strategy, an Invitation to Action* set forth principles and policy recommendations to increase energy efficiency; improve environmental quality; and assure adequate, cost-effective energy supplies for the state.

The Committee, authorized by the Legislature, and appointed in 1991 by then Governor Gardner, included executives and commissioners from private and public electric, gas, and oil companies; representatives of environmental organizations; and representatives from local and state government and private industry. The Committee worked for nearly two years to develop an energy strategy that emphasizes jobs, economic well-being, and environmental protection.

The Energy Strategy is an important document; not because it presents a completely new set of energy-related recommendations, but because it consolidates these actions into a single, organized framework to guide Washington's energy policy into the next century. These recommendations rely on known cost-effective technologies, beginning with improved efficiency, renewable resources, and wise use of natural gas.

Strategy Overview

Washington's Energy Strategy organized these recommendations into *five* main topic areas which are summarized below.

Transportation Challenges

The Strategy suggests revising the state's transportation planning processes to include and fairly evaluate the full range of transportation alternatives and to integrate planning for different modes of travel. It also focuses on the need to coordinate activities of agencies involved in growth management planning.

The efficiency of Washington's existing transportation system can be increased by improved intermodal connections, increased transit systems efficiency, and improved freight mobility.

The Strategy also encourages changes in the ways people travel by improving existing alternatives to single-occupancy vehicles such as rail, high occupancy vehicle lanes, and pedestrian and bicycle access. In addition, the Strategy recognizes that advanced communications technology can substitute for travel and further reduce demands on the transportation infrastructure.

Finally, the Energy Strategy identifies the need to fully explore the strengths and limitations of alternative transportation fuels and alternative-fuel vehicles.

Energy for Buildings, Farms, and Industry

The Strategy supports the pursuit of all cost-effective energy conservation and efficiency opportunities in buildings, farms, and industry. Important recommendations include implementing and enforcing the Washington State Energy Code and encouraging state and local government facility operations to lead by example in energy efficiency. Reducing barriers and supporting incentives to encourage conservation investments by investor-owned and public utilities will help maintain programs that ensure that all residents, including those on low incomes, have access to basic energy services such as heating and lighting.

The Strategy advises the state to encourage Diversity in energy supply, including new technologies and renewable resources such as wind, geothermal, biomass, and solar technologies; and discourages the exclusive reliance on new natural gas electricity generation. The efficiency of existing generation and transmission facilities should also be improved, including complete turbine upgrades at Columbia River hydropower sites. Improving access to existing interstate transmission lines needs to be explored as well.

The Strategy encourages the use of market forces, including fair competition, availability of credible information, consumer choices, and a level playing field for cost-effective fuel alternatives to support free market decisions. It also emphasizes strengthening and supporting utility resource planning to include developing and implementing comprehensive least-cost planning for gas utilities, integrated gas and electric least-cost planning, and planning for future gas pipeline needs.

Protecting Washington's Environment

The Energy Strategy supports the development and assessment of cost-effective options for reducing greenhouse gas and carbon dioxide emissions. In addition, the Strategy stresses implementing cost-effective energy policies that minimize environmental damage, as well as incorporating quantifiable environmental costs in energy planning and resource selection.

Siting Energy Facilities

The Strategy encourages rapid decision making in siting energy facilities and developing model local siting ordinances. The Strategy recommended that the legislature form a siting review panel to review siting procedures and recommend statutory changes. The work of this committee has been completed, and it was unable to agree on significant changes to the existing siting process.

Public Awareness and Education

The Energy Strategy identifies education activities that will increase the energy literacy of Washington's people. Public education and involvement in energy planning help the general public make informed choices that support Washington's energy policy. Educational activities include K-12 curriculum development and teacher training, commercial education events, training for energy professionals and development of energy curricula for higher education institutions.

Progress to Date

In 1994, the Legislature enacted ESB 6493 which made Washington's Energy Strategy the primary guide for implementing the state's energy policy. The legislation also provides for a public process to update the Strategy as needed. Also in 1994, Governor Lowry signed an executive order implementing the Washington Energy Strategy. The executive order:

- Determined that Washington's Energy Strategy would serve as the policy framework for energy decisions made by state agencies.
- Named the Washington State Energy Office as the lead agency for implementing the Strategy.
- Directed the Energy Office to convene an interagency working group to pursue implementation of the most promising policy alternatives in the Strategy.

The Energy Office's director convened the first meeting of the interagency working group - the Washington State Energy Strategy Task Force – in June of 1994. The Task Force is identifying recommendations in the Strategy that increase energy efficiency in state government and offer the most cost benefits. The Task Force will also look at regulatory barriers to energy efficiency in the commercial and industrial sectors; and opportunities, through tax structures, to encourage the use of renewable energy resources.

Appendix B contains a matrix of the Strategy recommendations that identifies agencies assigned to address each recommendation, and briefly describes the status of each recommendation.

Section 6

Washington's Energy Future

The Washington State Energy Office serves the citizens of Washington by providing innovative leadership for a sustainable energy future that is environmentally and economically sound. Washington's Energy Strategy provides the framework for this leadership.

The Washington State Energy Office is a leader in developing energy policy at the state, regional and national level. The Energy Office has an ongoing role in providing energy policy advice and support to the governor and the Legislature. Because the Energy Office is viewed by others as a source of objective, well-informed policy guidance, agency staff is routinely asked to participate in a wide-ranging number of forums, collaborative and committees throughout the region. When national debate promises to have significance for our state, Energy Office staff contribute their insights and experience to the process. The Energy Office, through its electronic bulletin board systems, also acts as a facilitator of discussion and communication on a broad range of energy-related topics.

The Energy Office participates in developing least-cost plans for investor-owned and publicly owned utilities. These include Puget Sound Power and Light, Washington Water Power, Pacific Power and Light, Washington Natural Gas, Northwest Natural Gas, City of Ellensburg, Seattle City Light and Tacoma City Light. As more publicly owned utilities begin developing integrated resource plans, the Energy Office will intensify its involvement in these processes. The Energy Office also participates in a variety of regional forums convened by the Northwest Power Planning Council, the Bonneville Power Administration and others that consider a range of key energy policy issues. These policy issues include conservation acquisition, utility rate design, regional transmission access, energy resource cost effectiveness and others.

The Energy Office's evaluation and program research staff assess the agency's own programs and provide expert assistance to outside evaluators such as Battelle Pacific Northwest Laboratory. They also provide planning assistance and contract evaluations of energy-related programs run by other agencies. They assist regional planning bodies in designing and improving their programs and do original research for national use in program design. The U.S. Department of Energy relies on the Energy Office to assist in its Pacific Northwest program planning activities.

Responding to Transportation and Land Use Challenges

More than 50 percent of our energy use is in the transportation sector. Today's transportation issues present Washington residents and planners with complex challenges. Those challenges require planners to devise an efficient transportation system that supports more than the movement of vehicles. The system must also ensure mobility and accessibility, address community needs, and balance environmental and land use goals.

In addition, users of the transportation system, particularly commuters, are being called upon to explore alternatives other than driving alone on congested freeways. The quality of air in

Washington state is primarily a function of motor vehicle use. The Washington Department of Ecology estimates that 75 percent of carbon monoxide emissions in the central Puget Sound region results from vehicle exhausts and 23 percent comes from other energy uses. Only 2 percent comes from other sources, such as slash burning. In Spokane County, 56 percent of carbon monoxide comes from vehicle exhausts and 21 percent comes from other energy uses.

Changes in the Way People Travel: Commute Trip Reduction (CTR)

State government, local jurisdictions and major employers are working together to implement Washington's Commute Trip Reduction law. In 1991 the Legislature passed the CTR law, incorporating it into the state Clean Air Act as RCW 70.94.521-551. The law seeks to reduce traffic congestion, decrease petroleum use, and improve air quality. CTR relies on employer-based programs that encourage commuters to use alternatives to driving alone to work. The law also established goals for reducing the number of "vehicle miles" traveled to affected worksites and the number of single-occupant-vehicle commuters at those worksites. The reduction goals are 15 percent by 1995, 25 percent by 1997, and 35 percent by 1999-measured against a 1992 base year average in each worksite location.

The law currently affects 57 jurisdictions and 843 worksites.¹ Each of the originally affected jurisdictions has passed a Commute Trip Reduction ordinance, and all worksites are implementing CTR programs. The first measurements of worksite program impacts will be completed by June 1995.

The Energy Office is responsible for evaluating program outcomes, and also directs a technical assistance team that includes representatives from the departments of Transportation and Ecology. The team provides training and technical assistance to local jurisdictions and employers affected by the law.

The Energy Office's Director chairs the Commute Trip Reduction Task Force created by the CTR law; The Task Force, which includes private and public employers, is responsible for assessing the success of the law and delivering a status report to the Legislature in December 1995.

Substitutes for Transportation: Telecommuting

Telecommuting substitutes for transportation by moving information instead of using automobiles to move people. Telecommunications and computers replace the need to travel by "linking" employers with their organizations. This alternative allows employees to work some portion of their work week at a location other than the traditional workplace. In most cases this means working from home or a location closer to home.

Telecommuting is becoming widely accepted in many parts of the country as a viable method for reducing congestion, energy consumption, and vehicle emissions. Its use in Washington is expanding. The Energy Office first began assessing the value of telecommuting more than five years ago-before the term "telecommuting" had entered the mainstream vocabulary. Today, Washington state employers can access a comprehensive collection of telecommuting-related information. Available data covers telecommuting's impacts on vehicle emissions, energy consumption and travel behavior, as well as organizational and employee benefits. The

Energy Office also works with the Department of Transportation to promote the use of telecommuting and provide training tools and technical assistance to employers.

The telecommunications industry is changing rapidly. The Energy Office continues to explore other telecommunications applications such as video conferencing; distance education and telemedicine as substitutes for travel.

Transportation Planning: The Least-cost Model

Washington's Energy Strategy specifically recommends that transportation plans use a "least-cost methodology." Least-cost planning compares the direct and indirect costs of demand and supply options to meet transportation goals and/or policies. This process allows transportation planners and the public to make informed choices that are based on an even-handed analysis of the supply and demand solutions. It follows the general concepts of integrated resource planning used by investor-owned electric utilities in the state.

In 1994, the legislature passed EHB 1928, which requires regional transportation planning organizations to develop their transportation plans in a least-cost manner. The legislation also directed the Department of Transportation to develop rules and guidelines for these organizations. The Department has asked the Energy Office to help draft the rules and guidelines.

Along with Washington's Energy Strategy, EHB 1928 adds additional stimulus for using least-cost methodologies in transportation planning. In the short-term, the transformation will require significant investments of human and financial resources. . First, the Department of Transportation's rules and guidelines will need to foster a clear, consistent definition of least-cost planning. Second, methodologies for analyzing different transportation scenarios need to be identified. Third, modeling programs must be re-developed; finally, results must be evaluated.

The Energy Office and the Department of Transportation introduced least-cost transportation planning to planners, economists, managers and academia in a symposium held last November. The first steps toward implementing EHB 1928 and fulfilling the policy direction of Washington's Energy Strategy are underway.

Growth Management

The decisions made today about land use patterns and the transportation system will impact Washington's energy use well into the future. Washington's Energy Strategy recognized this link, and the Growth Management Act (GMA) provided one mechanism for influencing communities' planning processes. During the 1993-95 biennium, the Energy Office worked with local governments to help them understand the energy implications of their GMA planning decisions.

Alternative Fuels and Air Quality

Interest in alternative transportation fuels grew in recent years as policymakers looked at ways to reduce foreign oil imports and improve urban air quality. Alternative fuel developments were also spurred by state and regional economic development groups promoting fuels and/or industries indigenous to their areas.

The Clean Air Washington Act of 1991 identified alternative fuels as a possible strategy for reducing vehicle emissions and directed the state to undertake a number of alternative fuel

activities. Washington's Energy Strategy reiterated the need to fully explore the strengths and limitations of alternative fuels.

The majority of these legislated activities have been completed. The state established a procurement policy to add low-emission vehicles to the state fleet; developed compressed natural gas refueling stations for public agency use; and supported advanced vehicle research and design at Western Washington University. The Energy Office prepared a series of technology assessments that evaluated the use of compressed natural gas, propane, methanol, ethanol and electric vehicles. In addition, the state has developed taxing policies which encourage the use of alternative fuels.

To date, there are more than 6,000 alternative fuel vehicles operating in the state. Recently, the level of alternative fuel activity has dropped as organizations such as Metro and King County have backed off of ambitious alternative fuels programs. These programs were stopped primarily because of their high costs and uncertain benefits. Other potential projects have also been postponed or eliminated because of funding constraints and an uncertain regulatory environment. Unlike other states that require alternative fuels as a clean air strategy, Washington's air quality is relatively good and getting better. As a result, regulators are employing lower cost control measures and are not considering alternative fuels as a strategy for meeting federal quality standards. This removes a major incentive for local fleet operators to switch to alternative fuel operations and places a much greater emphasis on the cost-effectiveness of alternative fuel vehicles.

The Energy Office expects a slow but incremental growth in the use of compressed natural gas, methanol, biofuels and electric vehicles. The development of a fueling infrastructure within the state remains a key challenge to using alternative fuels, particularly compressed natural gas. The primary focus of Washington's alternative fuel efforts over the next biennium will include technology demonstrations; niche fleet applications; private/public partnerships; monitoring of federal, state and manufacturer alternative fuel activities; and compliance with the National Energy Policy Act (§ 507). This latter requirement mandates the purchase of alternative fuel vehicles for state fleets starting in 1995 through the end of the decade.

Using Energy in Buildings and Industry

Utility Conservation Efforts Successful in 1993 and 1994

Utility-led conservation efforts were a major success story in the last two years. In 1991, the Power Council established the ambitious regional target of acquiring 1500 aMW of conservation by the year 2000. The region's utilities responded. Annual regional conservation savings jumped from 60 aMW in 1991 to 148.9 aMW in 1993. The 1993 results were the best ever for the region and exceeded Power Council targets. Puget Power led the investor-owned utilities, achieving savings of 29.7 aMW. Accomplishments for 1994 are still being tallied, but are expected to be comparable to 1993 results. While the future of utility conservation programs is uncertain because of utility industry restructuring, the past two years show that aggressive energy efficiency programs can deliver.

The Energy Office plays a strong support role to the state's and region's utilities. The agency continues to be a source of reliable information and technical assistance that help utilities acquire

conservation. The agency regularly holds regional industrial energy forums, co-sponsored by utilities and universities, which focus on new and better ways to promote and achieve industrial energy efficiency. The Energy Office provides information to utilities and their customers through its customized computer programs such as MotorMaster (a database of more than 11,000 electric motors) and Wattsun, an energy code compliance tool used throughout the region. Through its Community Education Program, the Energy Office supports utility conservation programs. Education enhances energy savings by improving consumer energy use behaviors and practices. For instance, consumer choices about space heating alone accounted for one quarter of all energy savings in the residential sector in 1986. The Energy office also works collaboratively with Bonneville, utilities, and private entities to conduct research on energy-efficient technologies for industry, business and consumers.

Energy Code Achieves Cost-effective Savings

The Washington State Energy Code also provides a cost-effective way to achieve energy efficiency in new buildings. In 1991, the Legislature authorized the state to update its "non-residential" or commercial energy code. The State Building Code Council (SBCC) adopted a new commercial section of the Washington State Energy Code, which took effect April 1, 1994. The revised code came about through extensive research, analysis, and negotiations with the construction industry, utilities, the Energy Office, the Northwest Power Planning Council, and environmental groups. The Energy Office estimates that over the next 10 years the commercial section of the code will generate 200 aMW of energy savings at a cost of approximately 1.9 cents per kilowatt-hour—a cost significantly lower than other generating resources. Seventy-five percent of anticipated electric energy savings will come from lighting efficiencies.

The new commercial section of the Washington State Energy Code addresses the design and construction of all buildings in the state except residential occupancies as defined by the Uniform Building Code. Washington's code is outstanding, capturing low-cost savings beyond that required by federal standards.² It represents one of the most comprehensive, cost-effective codes in the country. To ensure the code's effectiveness, the state's electric and gas utilities joined with general contractors and other construction interests to implement a unique technical assistance and training program. The utilities are financing the use of special building plans examiners and inspectors through the end of 1996. They are also financing training and technical assistance for general and subcontractors, building officials, architects and engineers. The Energy Office, SBCC, the region's utilities and others, as well as the Power Council provided the impetus for this partnership.

The residential section of the Washington State Energy Code, based on the Model Conservation Standards published by the Northwest Power Planning Council, has been in effect since July 1, 1991. The projected energy savings attributable to this portion of the code are approximately 125 aMW over the next 10 years.³ Through the Washington State Energy Code Program, funded by Bonneville Power Administration and electric utilities, the Energy Office continues to monitor energy code compliance levels in new residential buildings. An evaluation of statewide energy code compliance was done by Battelle Pacific Northwest Laboratory, based on data collected by the Energy Office. The study showed the average residential building achieved 97 percent compliance with the code.⁴ Knowing how to work with the energy code is important to success. Washington experienced a 20 percent increase in code compliance as a result of the Energy Office's education, training and monitoring programs for code officials, builders, contractors and retailers.

Market Transformation Presents New Way to Achieve Efficiency

To date, many utilities have run conservation programs on an individual utility level. While successful, these efforts have not achieved the results that a region wide or nationwide approach could achieve.

In the last two years; the design of energy efficiency programs has stressed the importance of market transformation approaches. The goal of market transformation efforts is to accelerate the widespread adoption of new energy-efficient technologies and practices by providing education and labeling; removing regulatory barriers; targeting incentives at the wholesale and manufacturer levels; and supporting energy codes and standards. When implemented region-wide or nationwide, these programs can have the dramatic effect of making old, inefficient practices obsolete.

Manufactured homes. The Pacific Northwest has pioneered market transformation in a number of sectors. The Manufactured Housing Acquisition Program (MAP)--a collaborative effort of Bonneville, the Power Council, the region's utilities and 22 Housing manufacturers-provides a solid example. The utilities and Bonneville pay incentives directly to the 22 manufacturers. All of the 10,000 to 13,000 manufactured homes built each year in the region are now constructed to energy-efficient standards, at little or no cost to the home purchasers. Cumulative savings will exceed 32 aMW over the five years of the program at costs well under the cost of new electricity generation.

The Energy Office conducted the research on which the MAP program was based and provided technical assistance to Bonneville and the Power Council. Data compiled by the Energy Office also identified potential regulatory barriers and problems with set-up procedures for MAP homes. In 1994, the legislature established a statewide certification and training program for manufactured home set-up crews.

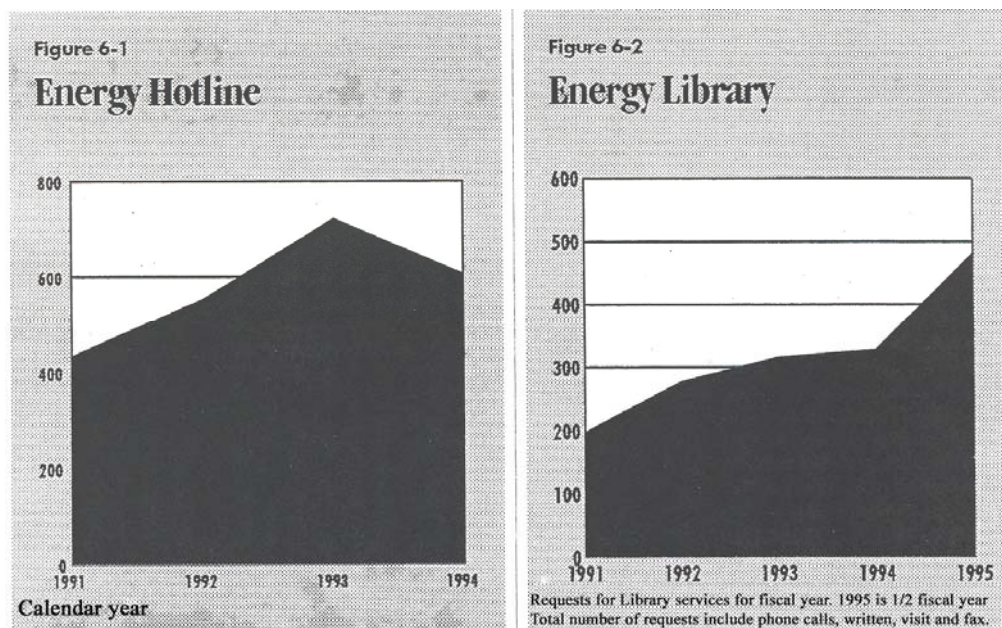
Residential appliances. Washington's utilities have also shown leadership in pursuing market transformation for residential appliances. Much of the impetus for the national Super Efficient Refrigeration Project came out of the Northwest. The project has encouraged manufacturers to design and build refrigerators that use 30 percent less energy than current national standards. Multi-utility collaboratives with manufacturers to improve the quality and energy efficiency of clothes washers and compact fluorescent lighting are now underway in the region. The Energy Office helped launch these initiatives by forming and staffing the Northwest Residential Energy-efficient Appliance and Lighting Group with financial support from Bonneville.

Public Facilities Lead by Example, Improve Energy Efficiency, Reduce Costs

In the past two years, the public sector has improved its energy efficiency by taking advantage of utility incentives. Puget Power contributed incentives of over a million dollars for energy-efficiency measures in the new Ecology, Natural Resources, and labor and Industries buildings. In 1994, Seattle City Light agreed to fund energy-efficiency improvements at the University of Washington--the largest energy consumer among state facilities. The agreement is based on a ten-year plan to retrofit the University with a variety of energy-efficient lighting and mechanical and control technologies, which are projected to save 15 million kWh per year and almost 4 MW of demand. The estimated yearly energy savings translates to \$1.3 million with a total project cost of \$8 million. Of this cost, Seattle City Light will be contributing \$5 million to the total project

cost, half the first year and the rest in the following year, subject to Seattle City Council appropriations. This agreement alone will result in enough energy savings to fuel 3,500 homes with electricity for 12 years, and is a major step in the commitment to improve the efficiency of public buildings.

Under RCW39.35C, implemented July 28, 1991, the Legislature assigned to the Energy Office additional authority and responsibilities for helping state government manage its energy costs. The lifetime benefits from conservation measures implemented in public facilities during 1992 and 1993 are estimated to be \$175 million. Additionally, the Energy Office has trained more than 2,000 building operators since 1989 to develop and implement energy management plans and practices in schools as well as in state and local government buildings. Significant opportunities for energy cost savings in the order of \$20 to \$30 million per year remain in the public sector, particularly state-operated facilities and public schools.



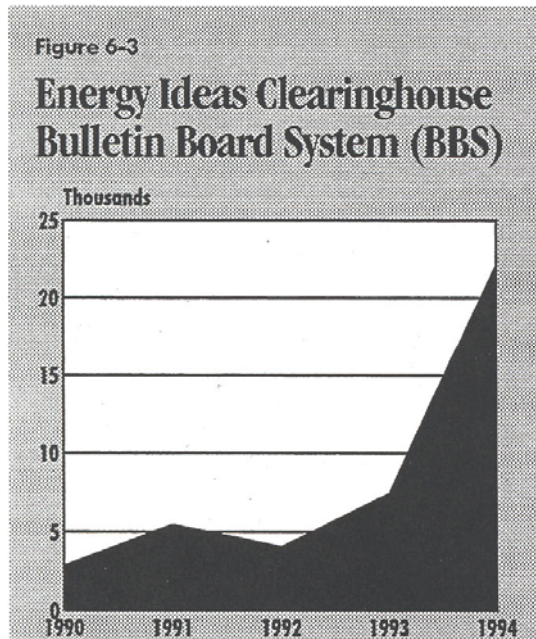
Public Ask for Information on Energy

The Energy Office spearheads a statewide education and training program that reaches all energy-using sectors. The core elements of the Energy Office's Education and Information program are:

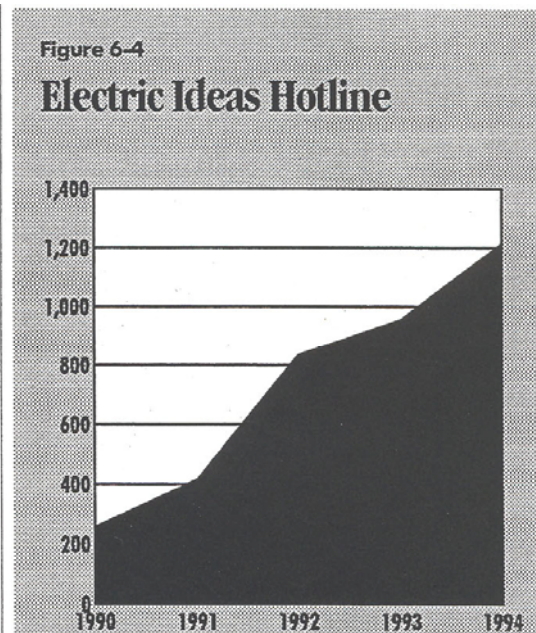
- a statewide Energy Hotline answering residents questions about fuel costs, heating systems and energy efficient products,
- consumer advice columns on home energy and resource conservation, which appear in newspapers statewide, including the *Seattle Times*, *Spokesman Review* and the *Olympian*.
- over 100 energy information fact sheets for residents and commercial and industrial users on energy technologies and energy efficient practices,
- an Energy Ideas Clearinghouse, which provides hotline, electronic bulletin board and library services to commercial and industrial energy users, and
- workshops, public events and training programs on location for residents, small

businesses, teachers and community leaders throughout Washington.

The program priorities are taken from Washington's Energy Strategy to serve energy consumers, K-12 education and institutions of higher education. The program goal is taken from the agency's Strategic Plan: "To motivate people through information and education to make energy choices that build a sustainable future."



Average number of connections to the BBS. 8,000 current users.



Average number of calls per month.

Developing Renewable Energy Resources

A guiding principle of the Energy Strategy is to cultivate diversity in energy supply, including new technologies and renewable resources such as wind, geothermal, hydro, biomass, and solar energy. In the past two years, the Energy Office increased its efforts to promote renewable resources by discussing their potential with utilities and other possible users. The agency also provided technical staff and some financial assistance for renewable energy projects. Recent developments in renewable energy include:

The Boeing Company's new Longacres Park

The treated wastewater, or effluent, from Metro's Renton sewage treatment plant provides heating and cooling for Boeing's new Longacres Park. The effluent retains much of the heat sent down drains from showers, dishwashers, and commercial and industrial processes. Boeing, through Metro's energy recycling program, taps into this energy reservoir. Heat pumps extract heat from the effluent pipeline and use it to heat and cool buildings at Longacres Park saving 2.2 million kilowatt-hours of electricity a year. The Energy Office's geothermal and district heating specialists brought Metro and Boeing together.

State-wide geothermal potential

The Energy Office and the Washington State Department of Natural Resource assessed the

state's low-temperature geothermal potential. The assessment includes databases on the physical and chemical characteristics of 941 thermal wells and 34 thermal springs. These sites hold potential for providing space heating and cooling requirements in agricultural or industrial applications.

Wind farms

Estimates for available wind resources in the state vary from a 1990 estimate of 450 MW to a more recent assessment of 2000 MW (capacity).⁵ Two large-scale wind farms are under development in Washington state. Bonneville is financing one wind farm, a 25 MW project administered by the Conservation and Renewable Energy Systems (CARES), a group of rural public utility districts. CARES expects to start construction in 1995 and complete the project by early 1996. The second project is a 50 MW wind farm financed by three investor-owned utilities from Washington and Oregon. Both projects are being constructed south of Goldendale in the Columbia Hills of Klickitat County. Both have completed Environmental Impact Statements for a combined capacity of 135 MW. However, they will be initially constructed at a 75 MW capacity, resulting in about 23 aMW of energy production. The expected life of each project is 30 years.

Demonstration grants

In 1994, the Energy Office established a matching grant program to promote development of small-scale renewable resources. Grants were offered to local governments, school districts, public utilities, and state agencies proposing projects that use photovoltaic, geothermal, solar, biomass or wind energy. Grants of up to \$10,000 will be awarded in 1995. Selected public agencies will obtain first-hand experience with renewable resources, and demonstrate the potential of renewable energy to other public agencies.

Utilities Planning Assistance

Under a contract with the Energy Office, CARES is examining how to incorporate solar, wind, biomass and geothermal energy into their integrated resource plans. CARES member utilities are currently developing integrated resource plans to estimate the need for generation over the next five years.

Addressing Global Climate Change

Recent Developments

Much attention has been focused in recent years on the issue of climate change. Scientists believe that increased emissions of certain gases—primarily carbon dioxide released during combustion—trap heat waves and warm the atmosphere. This is called the greenhouse effect. Scientists also believe that greenhouse warming could produce changes in climate.

Over the last century, atmospheric carbon dioxide levels have risen about 25 percent and the global average temperature has increased about 0.9°F. While some scientists dispute the conclusion that the observed temperature rise resulted from elevated greenhouse gas concentrations, most still agree that warming is inevitable. However, opinions differ regarding the magnitude and significance of both the warming and secondary changes in precipitation, storm severity, and soil moisture.

In 1992, representatives from over 200 nations met in Brazil to discuss how the world community should respond to global warming. This "Earth Summit" produced the Framework Convention on Climate Change, one goal of which is to stabilize "greenhouse gas concentrations at a level that would prevent dangerous anthropogenic interference with the climate system." On April 21, 1993, President Clinton established a national goal of lowering greenhouse gas emissions to their 1990 levels by the year 2000. In October of 1993, the Administration released its Climate Change Action Plan detailing nearly 50 new and expanded initiatives to achieve the stabilization goals.

Implications for Washington State

The state faces two challenges related to climate change. One is limiting the growth of greenhouse gas emissions without imposing undue costs on the state economy. This will be especially difficult, given that most new emissions will come from energy use-particularly natural gas-fired combustion turbines. The other challenge is maintaining the flexibility to respond to federal regulation of carbon dioxide emissions, should they occur. For example, regulation could take the form of a federal carbon-related tax. If most of Washington's new generation comes from combustion turbines, electricity costs could increase dramatically with such a tax.

Washington's Energy Strategy recommended that the state develop a comprehensive inventory of greenhouse gas emissions and identify measures that might be considered to meet a range of gas concentration targets. In support of the Strategy; the Energy Office initiated a three-phase study of potential climate change in Washington funded by the Environmental Protection Agency.

Phase 1

Phase 1, completed in July 1994, catalogued greenhouse gas emissions by amount and source category for 1990 and projected emissions in 2010. In Washington, four gases makeup the vast majority of greenhouse emissions: Carbon Dioxide, Methane, Nitrous Oxide and Carbon Tetrafluoride.⁶ The table normalizes emissions estimates of those gases into carbon dioxide equivalents.

This effort revealed that Washington's greenhouse gas emissions differ significantly from national averages. Nearly all of the state's electricity comes from hydro or nuclear sources, both zero greenhouse gas emitters. Washington's forests also strongly influence net CO₂ emissions. Nationally; biomass removes about 12 percent of the emitted CO₂; it removes nearly three times as much of Washington's emissions. Another anomaly is Carbon tetra fluoride emissions by the aluminum industry – a small amount of emissions that represent almost 8 percent of the 1990 CO₂ equivalent inventory. Washington's greenhouse gas emissions accounted for about 6 percent of the national inventory in 1990.

Emissions Summary by Source (in thousands of tons)⁷

Emissions Sector	Carbon Dioxide 1990	Equivalent Emissions 2010
Energy Related (end-use)		
Residential	9,970	14,720
Commercial	5,870	9,100
Industrial	22,560	32,270
Transportation	46,637	66,080
Coal Mining	114	121
Subtotal	85,151	122,291
Material Production Related		
Cement Production	244	618
Lime Production	456	456
Aluminum Production	7,207	5,530
Land Fills	4,827	3,066
Forest Long-Term Products	14,160	15,180
Forest Short-Term Products	4,400	3,900
Forest Residue	14,200	15,400
Forestry Slash Burns	1,063	427
Net Annual Forest Growth	(42,600) *	(51,500)
Subtotal	3,957	(6,923)
Agricultural Related		
Cattle (Range, Dairy, Beef & Other)	1,129	1,129
Manure (Dairy, Broilers & Layers, Beef, Swine, & Other)	584	584
Fertilizers	790	790
Field Burning	90	108
Subtotal	2,593	2,503
Land-Us Related		
Convert Forests to Other Uses	4,319	4,319
Sequestration in Forest Reserves	(3,800)	(8,440)
Wetlands	149	146
Subtotal	688	(3,975)
Total Net Carbon Dioxide Equivalent Emissions	92,369	113,896

* Estimate updated from previous Washington State Energy Office Reports

Phase 2

In the second phase of the climate change study; targeted for completion in 1995, the Energy Office will develop a reduction strategy for the state's greenhouse gas emissions. This phase involves two separate steps. The first, already underway; is an assessment of the likely consequences of climate change in Washington state. Such an assessment provides policymakers with some notion of the consequences of climate change for Washington. It is a difficult task given the uncertainties which exist, but it provides a glimpse of possible impacts.

The second phase goes on to analyze various greenhouse gas control measures available to the state. Since greenhouse gas emissions are primarily a by-product of energy generation and use, the measures available largely center on reducing the use of fossil fuels. Phase 2 will conclude with specific recommendations for mitigation and adaptation measures.

Phase 3

The third phase will study implementation of the measures recommended in Phase 2. This third phase may be the most difficult. Contemporary societal needs make it politically difficult to

allocate resources to a problem of uncertain magnitude that may not manifest itself for several decades. The recommendations coming out of Phase 2 will determine the scope of work for Phase 3.

Conservation, renewable resources, and high-efficiency generation minimize environmental impacts of all types, including greenhouse gas emissions. Encouraging these alternatives allows Washington to have a "no regrets" policy toward climate change. In other words, even if the greenhouse effect does not produce adverse climate changes, Washington will not have made wasteful investments because those investments 'made sense for other reasons. Furthermore, climate change is taking place; the state's actions would help stabilize greenhouse gas emissions.

Conclusions

In the coming year, the people of Washington will spend over \$10 billion to heat their homes, light their businesses - power their industries and run their transportation systems. Washington's economic and environmental health is clearly linked to its ability to maintain an affordable, safe and reliable energy supply. The Energy Office serves the people of Washington as a leader in developing energy policy and as an innovator in bringing new energy technologies, techniques and practices into our state; all the while providing the citizens with reliable, objective and timely information on energy needs and issues.

The Energy Office will continue to seek resources inside and outside the state to support our mission. Our role in improving the energy efficiency of Washington's economy and reducing energy costs, as well as providing leadership in the implementation of the state's Energy Strategy, are key factors in providing for a sustainable energy future for the citizens of Washington. It is our goal to continue to play a leadership role where needed, a catalyzing role when useful and a supportive role when helpful to ensure a safe, affordable, reliable and environmentally sound energy future.

Water: A Resource in Peril?

From hydropower to aluminum to agriculture, water plays a vital role in Washington's economy. Demand for water continues to increase as the state's population and economy grow. As a result, competition is tightening; municipalities, businesses, resource agencies, tribes, industry and agriculture all vie for a finite supply. In some areas of the state, water shortages are already occurring and restrictions on additional withdrawals are being enforced. The region's continued drought and the listing of several salmon runs as threatened or endangered species complicate this situation.

Washington's energy industry is not immune to this changing environment. The Columbia River system provides the most obvious example of how water affects the status quo. While the region debates the merits of various operational changes to the Columbia River dams, the outcome remains fairly certain: Less water will be available for power generation. It is also fairly certain that the pain of reduced supply will be shared by other consumers including irrigated agriculture. Statewide, agricultural uses of water account for over 76 percent of the water used, with municipal and industrial water users consuming approximately 12 percent and 11 percent, respectively.

Water and energy issues extend beyond the Columbia River system. Two of the current energy projects before the state's Energy Facility Site Evaluation Council have water supply concerns. The proposed 838 MW natural gas power plant in Creston, Washington intends to obtain water rights from the Spokane River and withdraw the water from the Columbia River. The 460 MW Chehalis combined-cycle combustion turbine also faces water supply constraints which will need to be worked through before the project can proceed.

The need for a continued and healthy water supply has spurred a number of public and private initiatives. Many of them will examine current water policy and look toward improving allocation and use at both the water basin and consumer levels. Water conservation and improvements in water efficiency are key resource tools that will be an integral part of water management programs.

Water managers are already applying conservation lessons learned from the electric utility industry. They will continue to look to this industry for opportunities and methods. Examples include cooperative programs between water and electric utilities, such as those offered by Seattle City Light, Tacoma City Light and the Energy Office. These programs recognize that many water conservation actions such as efficient showerheads also save energy, thereby providing a win-win opportunity for both types of utilities. This synergism also exists in irrigated agricultural and in some industrial applications where water conservation measures reduce pumping energy requirements, thereby saving both water and energy.

In addition, a planning tool first used by electric utilities might hold promise for water management planning as well. Battelle-Northwest has been exploring the possibility of extending and applying the techniques of IRP and demand side management to water resource allocation. An integrated water resource management plan would focus on the services provided by water and their value to the consumer-not simply on the quantity of water involved. Establishing the value of water services in different uses could allow the development of trade-off mechanisms and lead to the establishment of water markets.

End Notes

6:1 The Commute Trip Reduction law applies to organizations that meet the following criteria: They employ more than 100 full-time employees at a single worksite; those employees' work hours begin between 6 and 9 a.m.; the organizations are located in counties with populations over 150,000.

6:2 EPACT requires all states to pass a stringent non-residential energy code and decide whether or not to revise its residential energy code to meet Model Energy Code levels. Washington is one of the few states with an energy code that meets all national standards.

6:3 *Getting to Code: Economic Costs and Benefits of Developing and Implementing Washington State's Residential Energy Code*, Washington State Energy Office, 1993.

6:4 *New Residential Construction Compliance: Evaluation of the Washington State Energy Code Program*, Pacific Northwest Labs, July 1993.

6:5 1991 Northwest Conservation and Electric Power Plan, V. II Part II, NWPPC, p. 633. The higher assessment is based on the Energy Office's analysis of improved efficiencies of technology, size of new wind farms under construction, and additional testing sites.

6:6 Chlorofluorocarbon gases are not included. Though potent greenhouse gases, they also destroy stratospheric

ozone, another greenhouse gas, negating their global warming effort.

6:7 Sources for the Washington state greenhouse gas inventory are: Kerstetter, J, *Greenhouse Gas Emissions Inventory for Washington State*, 1990, Washington State Energy Office, 1994, and Kerstetter, J, *Projected Greenhouse Gas Emissions Inventory for Washington State in 2010*, Washington State Energy Office, 1994.

Appendix A

Energy Policy Act: Summary of Key Features of Interest to Washington State

Energy Policy Act of 1992

Summary of Key Features of Interest to Washington State

On October 24, 1992, President George Bush signed into law the Energy Policy Act of 1992 (EPACT). The legislation has a number of important features and could change the way energy is addressed in the United States for years to come. The legislation authorizes a number of new funding programs but does not provide a funding mechanism. This means it does not appropriate the funds necessary to satisfy all these new programs.

This appendix summarizes some provisions of EPACT that have particular importance to Washington state. Action items are italicized.

Building Energy Efficiency Standards

Building Codes: Section 101 of EPACT requires the U.S. Department of Energy (USDOE) to establish initial federal building energy standards that meet or exceed the Council of American Building Officials Model Energy Code for residential buildings and the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) 90.1 standard for commercial buildings. New federally owned buildings would then have to meet the federal building standards, as would new homes financed through FHA, VA, and FHA loans. EPACT mandates that each state certify that it has reviewed the provisions of its residential building codes and has made a determination as to whether it is appropriate for the state to revise its residential energy code. EP ACT requires that states adopt commercial building standards that meet or exceed the recommended ASHRAE 90.1 within two years.

Action required: The Washington State Energy Office performed analysis of Washington's residential and non-residential energy codes to determine compliance with the standards set forth by the Act. The State Building Code Council submitted this analysis to USDOE. Both codes are in compliance.

Regional Lighting and Building Centers

This provision in section 103 directs USDOE to fund ten regional centers to demonstrate and promote energy-efficient lighting and building technologies.

Home Energy Ratings and Energy Efficient Mortgages

Section 102 of the Act requires that, within 18 months of enactment, USDOE shall issue voluntary guidelines for home energy ratings. USDOE will provide assistance to state and local organizations to support adoption of programs using these energy rating guidelines.

EPACT links to this rating system an Energy Efficient Mortgages Pilot Program described in sections 105 and 106. The U.S. Department of Housing and Urban Development (HUD) will establish a five-state pilot program to promote energy efficient mortgages, including permission

for federally insured loans to include 100 percent of the energy efficiency improvements. The rating system will establish cost effectiveness for the pilot programs.

Manufactured Housing Energy Efficiency

This provision in section 104 required that HUD publish revised energy efficiency levels by October of 1993 or the State's would gain the authority to issue energy efficiency standards for manufactured homes (a.k.a. mobile homes).

Action required: HUD's new standards resulted in a 30-percent reduction in energy consumption relative to the old standards established in the 1970's. Manufactured homes sited in Washington state are currently built to energy efficiency levels that exceed these federal standards. This is presently due to a region-wide utility sponsored energy savings program.

Integrated Resource Planning and Related Provisions.

Sections 111-115 of EP ACT amended the Public Utilities Regulatory Policy Act of 1978 (PURPA) to require regulators and certain natural gas and electric utilities to consider adopting several new "PURP A standards." PURP A standards are expressions of regulatory or utility policy that achieve the goals of conservation, optimization of efficiency, and equitable rates. The standards that must be considered are the following:

- Integrated resource planning for electric and gas utilities (EP ACT sections 111, 115(a)).
- Regulatory mechanisms that hold these utilities financially harmless for achieving energy conservation (EPACT sections III, 115(b)); and
- Efficiency in transmission and distribution (EP ACT section 111).

These EPACT requirements apply to all regulatory commissions, and to publicly owned electric and gas utilities over a certain size (sales of 500,000,000 kWh annually for electric utilities; sales of 10 billion cubic feet for gas utilities). The Energy Office calculates that these provisions apply to fifteen or sixteen publicly owned utilities in Washington state. Procedures for adopting or rejecting standards vary with respect to each standard, but most require at least a public hearing and a written statement of adoption or rejection. Deadlines for action are: October 23, 1995, for electric standards; October 23, 1994, for natural gas standards.

Action required: The Washington Utilities and Transportation Commission (WUTC) and several publicly owned utilities must consider whether to adopt new PURP A standards (or, alternatively, whether standards have already been adopted). Reasons for acceptance or rejection must be stated in writing.

Testing and Labeling for Windows

Section 121 provides support for creating a voluntary national window rating program for the development of national testing procedures and labeling programs.

Efficiency Standards for Commercial and Industrial Equipment

Sections 122, 123 and 124 establish minimum efficiency standards and test procedures for certain types of lamps, motors, commercial heating and air conditioning equipment, and plumbing fixtures (showerheads, faucets, and toilets). USDOE will also set energy efficiency standards for other lamps, utility distribution transformers and small electric motors upon determination that these standards would be technologically feasible and economically justified. The dates these standards take effect vary between no earlier than January 1994 to October of 1997, depending upon the technology.

Efficiency Testing and Ratings for Office Equipment and Fluorescent Light Fixtures

Presently efficiency ratings are not available for office equipment (computers, copiers, etc.) and luminaires (fluorescent light fixtures). Sections 125 and 126 provide financial and technical assistance to support a voluntary testing and information exchange program (rating system). USDOE may establish a testing program if not done voluntarily.

Advanced Appliance Development and Early Replacement Programs

Sections 127 and 128 require evaluations of the potential for high efficiency appliances and a study of early replacement of appliances.

Industrial Programs

Section 131 provides for a grants program to industry to promote energy efficiency on a voluntary basis. Section 132 creates a program that would increase energy efficiency in production practices rather than focusing strictly on building envelope efficiencies. In order to be eligible for a grant, (via the State) an industry association must establish voluntary efficiency improvement targets for its members.

Action required: The State must have implemented an Integrated Resource Planning (IRP) program consistent with the IRP provisions of this statute. The program essentially mandates utility participation.

State and Local Assistance Program Changes

EP ACT contains a number of amendments regarding how states can use funds received under the state energy conservation program (SECP). Section 141 (a) creates a state buildings energy incentive fund, which would provide a \$1 million per State fund for use in a revolving load program. The funds would be used to finance energy efficiency improvements in states that have "demonstrated a commitment to improving the energy efficiency of buildings." The factors that will determine whether to provide the grants include: whether the state or a majority of local governments have adopted codes as stringent as those set forth in EP ACT; whether a revolving load program has been established; and whether non-federal funding sources have been obtained in a 3: 1 ratio.

Section 142 creates a new program of financial assistance to weatherization providers to encourage leveraging of other funding sources. One amendment allows weatherization funds to be used for the installation of solar water heaters or wood-burning stoves.

Federal Energy Management Program (FEMP)

The FEMP program establishes a new requirement of reducing federal building energy use by 20 percent per gross square foot below the 1985 level by the year 2000. Section 152 of EP ACT further requires the installation (by the year 2005) of all energy and water conservation measures with payback periods of 10 years in federal buildings to the maximum extent practicable.

Sections 156-157 specifically establish an intergovernmental energy management training effort, with biennial conferences and with participation encouraged from state officials; it also encourages federal/state coordination of these efforts.

Section 161 encourages the General Services Administration and other agencies to procure energy efficient products.

District Heating

Section 172 establishes a required study of the benefits and cost-effectiveness of district heating and cooling programs.

Natural Gas

Section 201 limits restrictions on gas imports and exports in order to avoid any price restrictions on gas imports or pipelines. Section 202 states: "It is the sense of the Congress that natural gas consumers and producers, and the national economy, are best served by a competitive natural gas wellhead market."

Alternative Fuels

Section 404(b) provides that the transportation or sale of natural gas for use in vehicles by someone that is not already a public utility is not to be regulated by state regulatory agencies, such as the WUTC.

Section 409 establishes a state and local alternative fuels vehicle (AFV) incentive program to promote use of these vehicles. Section 507 (0) mandates the following state vehicle purchases of AFVs: 10 percent in model year 1996; 15 percent in model year 1997; 25 percent in model year 1998; 50 percent in model year 1999; and 75 percent in model year 2000 and thereafter.

Wholesale Competition

Section 711 creates a new category of wholesale electric provider called "Exempt Wholesale Generator" (EWG). Any owner of a power plant that intends to use its generation solely to make

wholesale sales can apply for EWG status. EWG status exempts the generator from regulation at the federal level as a public utility.

Section 712 requires state regulators to hold hearings to determine how increased competition at the wholesale level would affect regulated utilities' ability to raise capital and other related impacts. The WUTC completed its proceeding in 1994.

Action required: Hearings regarding effect of independent power on utilities' ability to raise capital. This has been done.

Transmission Provisions

Section 721 amends the Federal Power Act to provide that the Federal Energy Regulatory Commission can order a utility to provide access to its transmission system by any wholesale generator. This includes requiring the utility to build transmission, if necessary. Section 722 establishes the standards for rates, terms, and conditions that will be imposed upon the requesting wholesale generator.

Section 722 also makes it clear that these provisions are not intended to interfere with states' authority to order or prohibit retail access to transmission.

Section 722 also contains a special provision for the Bonneville Power Administration. While the Federal Energy Regulatory Commission can require Bonneville to make transmission available, the standards for "rates, terms and conditions" are to be consistent with Bonneville's organic statutes and must be just, reasonable and not unduly discriminatory.

Taxation

Section 1911 permits an employer to pay an employee up to \$160/month for mass transit or ridesharing expenses (up from the present \$21/month level). The employer is permitted to fully deduct the amount from the employer's gross income for federal tax purposes. This provision also caps the deductibility of employer provided free parking expenses at \$155/month.

Section 1912 excludes from customer's gross income for federal tax purposes the payments made by utilities or the federal government to residential ratepayers for energy conservation measures. For commercial and industrial consumers, the exclusion is phased in to reach 65 percent by 1997, beginning at 40 percent in January of 1994.

Section 1913 describes deductions for clean-fuel vehicles.

Section 1931 provides for an increase in the base income tax rate for ozone-depleting chemicals.

Appendix B

Energy Strategy Recommendations

Energy Strategy Recommendations Status as of December 1994

Energy Strategy Recommendations	Agencies Involved	Status
TRANSPORTATION		
Least Cost Planning		
<p>Washington State Department of Transportation (WSDOT) should establish a least-cost planning process that:</p> <ul style="list-style-type: none"> specifies the goals of the transportation system and objective measures for each goal fairly evaluates the costs of both demand-side and supply-side options integrates planning for different modes of travel selects a mix of options designed to meet overall system goals at the lowest cost to society involves appropriate agencies with environmental, energy, and land use expertise involves the public 	DOT WSEO	DOT and WSEO held. a Least Cost Transportation Planning Symposium in November 1994 and published papers on the topic. WSEO is working with the DOT on developing a WAC to help regional transportation planning organizations comply with Chapter 158, sessions law 1994.
Changing the ways people travel		
The state should make cost-effective investments to improve the rail system for greater use in the Vancouver, BC to Portland corridor.	DOT	Ongoing.
The state should complete construction of Puget Sound area HOV lanes; arterial connections to the system; ramp access; and the parking, pedestrian, and bicycle access necessary for bus and vanpool use.	DOT	Ongoing,

The Washington State Energy Office (WSEO) should promote successful implementation of the Commute Trip Reduction Law, encouraging employer and employee use of transportation demand management.	WSEO	Has been implemented since 1992 and is scheduled to report back to the legislature in December 1995.
DOT, cities, and counties should provide opportunities for safer and more accessible bicycle and foot transportation directly into core city areas.	DOT	Ongoing.
DOT should develop a specific proposal for a congestion pricing pilot program, whereby users of highways would be charged during peak period.	DOT	DOT is currently addressing this issue within the Partnerships Program.
Developing substitutes for transportation		
The Washington Utilities and Transportation Commission (UTC) should work with WSEO to assess the long-term ability of communications technology to substitute for transportation.	UTC WSEO DOT	WSEO chaired a subcommittee of the Transportation Commission Steering Committee to develop a report exploring telecommunication and transportation linkages.
The state should encourage the establishment of centralized "telework centers" in urban and suburban areas.	WSEO DOT	Preparing guidelines for siting telework centers.
The state should locate significant state office facilities in non-metropolitan areas, using telecommunications to provide needed information links.	GA WSEO	Coordinating with General Administration's efforts to explore benefits of office space consolidation and collocation of state agencies; and investigate the potential of implementing a facilities exchange program for telecommuting.
The state should develop a model telecommuting program and policies that could be adapted by government agencies and the private sector.	WSEO	Completed and available through General Administration as part of State Government Commute Trip Reduction Guidelines.
The Department of Information Services should continue to work with public and private organizations to develop video conferencing as an alternative to travel.	DIS	Thirteen video conferencing centers are up and running Contract with the University of Washington to connect four additional sites set for early 1995.

The UTC and telecommunications companies should consider tariffs to encourage widespread access to services providing simultaneous transmission of voice and data.	UTC	No current action.
Using alternative fuels		
The Departments of Ecology, General Administration, and WSEO should work together to ensure that current state purchasing requirements for clean-burning vehicles fit federal mandates.	Ecology GA WSEO	Ongoing.
The state should develop the infrastructure necessary for alternative fuel experiments. WSEO should track those experiments	WSEO	Working with local government and industry.
The public should be advised on conversions of private vehicles to a specific alternative fuel only when results of alternative fuel experiments are clearly known.	WSEO DOT	Ongoing. A series of technical reports and fact sheets have been completed and are available to the public.
The Department of Ecology should develop emissions performance standards for alternative fuel vehicles.	Ecology	Ongoing. State is currently purchasing low-emission vehicles based on performance standard.
WSEO, DOT, and the Department of Revenue should better define "alternative fuels" and establish a clearer basis than now exists for differential tax treatment.	WSEO DOT Revenue	Ongoing. WSEO has completed one report dealing with fuel taxation.
WSEO and Ecology should explore the development of a cooperative West Coast (British Columbia, Washington, Oregon, and California) effort to ensure maximum learning, minimal duplication of effort, and development of a larger market for low-emission vehicles.	WSEO Ecology	Ongoing. WSEO is in close contact with both British Columbia and Oregon regarding alternative-fueled vehicle actions. Anticipate working together on emissions labeling effort

Improving freight mobility		
The UTC should work to improve the energy efficiency of the trucking industry by developing regulatory mechanisms that promote cost-effective and efficient use of fuel.	UTC WSEO	No action; state trucking regulation Effectively abolished via federal legislation.
The state should revitalize the state rail abandonment program to avoid further railroad right-of-way losses and, where appropriate, purchase and preserve abandoned rights-of-way for use as transportation corridors.	DOT Attorney General WSEO	Ongoing.
WSDOT should examine ways to promote broader use of rail freight options.	DOT	Ongoing.
Improving vehicle efficiency		
The State should seek our Congressional delegation's support for increased federal Corporate Average Fuel Efficiency (CAFE) standards.	DOT Ecology WSEO	No current action.
The state should propose that the western states expand purchasing consortia to include vehicle fleet purchases, with the aim of stimulating auto manufacturers to develop safe, higher-mileage, and lower-emission vehicles.	GA WSEO	Under consideration.
The Departments of Revenue, Licensing, and WSEO should develop a proposal for the 1994 legislative session to change the current license registration and excise tax system, so that it charges less for vehicles with better mileage/emissions performance and more for vehicles with poor performance.	DOR DOL WSEO	DOR is looking into this.

Funding alternatives		
The state should examine all transportation funds and reprogram the funds to promote efficiency goals.	DOT UTC	DOT had a subcommittee explore options.
The state should realign existing taxes to reinforce policy goals, particularly to ensure that tax structures do not provide incentives to increase vehicle miles traveled, increase emissions, or decrease vehicle efficiency.	DOT Legislature	No current action.
The state should take advantage of available federal funds for developing new programs or technologies.	DOT	Aggressively working to take advantage of funds available through the Intermodal Surface Transportation Efficiency Act.
The state should raise new revenue by taxing the commodity or activity causing the problem. Revenue alternatives that merit consideration include: raising the fuel tax; extending the sales tax to sales of vehicle fuels; repealing tax exemptions for alternative fuels; and repealing the 18th Amendment to the state constitution so that existing gas tax money may be used for other transportation needs besides highways.	DOT UTC Legislature	Ongoing.
Growth planning for energy efficiency		
DOT and WSEO should jointly develop a technical assistance program for local planners on the energy implications of different growth planning strategies.	DOT WSEO	Part of Growth Management Act. WSEO's program provides technical assistance and education; and reviews and comments on comprehensive plans and development regulations.
WSEO should work with other interested parties to develop models for planners that demonstrate energy implications of alternative urban designers; help local governments enact solar ordinances; and advocate comprehensive plans that preserve opportunities for efficient renewable energy projects.	WSEO	Ongoing. Developing PLACES's modeling.

ENERGY FOR BUILDINGS, FARMS, INDUSTRY		
Natural Gas Planning		
The state's gas utilities should work closely with WSEO and the UTC to develop and implement comprehensive least-cost planning.	WSEO UTC	All gas utilities have accepted least cost plans on file.
Gas utilities should implement cost-effective conservation measures and programs in their service territories consistent with their least-cost plans.	WSEO UTC	Gas utilities have filed Demand Side Management tariffs.
The state's electric and gas utilities should work closely with WSEO and the UTC to integrate their least-cost planning.	UTC WSEO	Joint pilot effort by gas and electric utilities completed summer 1994.
WSEO, in cooperation with UTC, utilities, the Bonneville Power Administration (BP A), and the Northwest Power Planning Council (NWPPC) - should provide a report to the governor and legislature clearly identifying the nature and extent of savings available from cost-effective fuel choice.	UTC WSEO	NWPPC identified fuel choice as a "resource." NWPPC staff is completing study.
UTC should change its line extension policy to develop new pricing methods to permit recovery of costs from lower volume lines.	WSEO UTC	Washington Natural Gas has filed a tariff.
The state should encourage electric utilities to consider fuel choice as a resource in their least-cost planning and to implement appropriate programs.	UTC WSEO	UTC may consider as part of regulatory reform. Two fuel choice programs in Washington are operating.
The state should encourage BP A to review its new experimental fuel choice program and refine it where it can be shown that fuel choice is cost-effective and reduces the need to use gas for electricity generation.	NWPPC UTC WSEO	WSEO will monitor results of the experiment.
The state's gas and electric utilities should provide clear information to support cost-effective fuel choices.	UTC WSEO	This was a joint utility recommendation of pilot program. WSEO fact sheets address this.

Gas policy and siting		
WSEO, in coordination with the state's electric and gas utilities and customers, should develop regular statewide estimates of natural gas use.	WSEO	Ongoing. Part of Washington State Energy Use Profile.
WSEO and the Department of Natural Resources should closely monitor coal bed methane to determine its potential as an indigenous gas supply that could be developed without new interstate pipeline capacity.	DNR WSEO	No current action.
WSEO should develop ways to track the efficiency of natural gas use in the state.	WSEO	Ongoing. Part of Washington State Energy Use Profile.
Conservation in use of electricity		
The state should support the aggressive pursuit of all cost-effective conservation and efficiency opportunities in both public and private utility markets.	WSEO UTC	All private utilities pursue Demand Side Management WSEO supports public utility development via BPA and CARES. WSEO education and training activities support this recommendation.
The state should support the effort to develop and implement regulatory approaches that align private utilities' financial interests with the successful implementation of their least-cost plans.	WSEO UTG	Regulatory mechanisms in place for all three private utilities; part of UTC Notice of Inquiry.
BP A should develop better incentives and market conditions to ensure the successes of conservation investments in service areas of public utilities - both larger utilities in major urban growth areas and smaller utilities in slow-load growth areas.	WSEO	WSEO is a member of the Sounding Board for BP A's Business Plan and participates in regional negotiations and forums.
The state should regularly revise state commercial and residential building codes to achieve the region's conservation targets.	CTED WSEO SBCC	Commercial energy code revised in 1994.
BPA and the investor-owned gas and electric utilities should include the cost of supporting code implementation (education, training, and enforcement) as a high priority for funding.	WSEO Legislature UTC	Residential Code - training and technical assistance ongoing. Commercial Code - Electric and gas funding group established, Utility Code Group. Industry training group established, Building and Design 2000.

Renewable Energy Sources		
Utilities and BP A should experiment With targeted solicitations for renewable resources that are nearly competitive with gas.	WSEO	Nine projects underway.
The Power Council, BPA, UTC, and utilities should move quickly to improve their ability to evaluate the full range of benefits from renewable energy technologies.	WSEO UTC	The five year Power Plan Will address this.
The state should consider renewable energy projects, such as wind turbines, suitable on parcels of land designated as range land or open space.	Attorney General DOR WSEO F&W	Renewable energy options are being explored by WSEO, CARES, and others.
Non-utility fuels		
The state should support wide dissemination to homeowners and building operators of information describing practical opportunities to improve the efficiency of buildings using petroleum, coal, and wood.	WSEO	WSEO has ongoing public information programs such as Energy Hotline, newspaper columns, Community Energy Project, and the Energy Ideas Clearinghouse.
The state should support actions to improve efficiency in the use of non-utility fuels in public buildings.	WSEO GA	Limited activity. Developing new renewables program. Life cycle cost analysis for new buildings includes renewable resources.
Low-income assistance		
The state should support funding that .addresses the energy needs of low-income citizens.	CTED UTC	Working with the Housing Energy Efficiency and Preservation Advisory Council.
The Department of Community, Trade and Economic Development (CTED) should work with WSEO, the Office of the Attorney General, and electric and gas utilities to ensure that low-income weatherization programs address energy savings for the largest number of low-income citizens possible.	CTED WSEO Attorney General UTC	Working with the Housing Energy Efficiency and Preservation Advisory Council. WSEO and UTC exploring low income programs.

Energy Education		
The state should support education activities that increase the energy literacy of Washington citizens.	CTED DOT SPI Governor's Council on Env. Educ. WSEO	Ongoing. Newspaper columns, Energy Hotline, fact sheets, Community Education Programs. Energy Awareness Campaign starting spring 1995..
The legislature should provide funds to the Superintendent of Public Instruction (SPI) to produce the second phase of the "Energy, Food, and You" curriculum.	SPI	No current action.
WSEO should survey utilities and building operators and advise the Higher Education Coordinating Board about what programs should be developed to train technicians and system operators for conservation and efficiency work in the residential, commercial, and industrial sectors.	CTED HECB WSEO	Creating a certification program for building operators. Starting consortia to address residential training assistance. Ongoing Builder Operator Training.
The state's universities should examine their engineering and architecture programs to ensure that tomorrow's professional graduates are prepared to design facilities of all kinds with energy use in mind.	HECB WSEO	WSEO Clearinghouse services to university architecture and engineering programs. Energy Design for Professionals program.
Higher education programs should include energy education units in pre-service and in-service teacher training.	HECB SPI	Support development of summer institute in "Energy, Food, and You." Assess current level of energy education.
Carbon dioxide and global warming		
WSEO should develop a more comprehensive inventory and projection of carbon dioxide and other greenhouse gas emissions and identify the most cost-effective measures for meeting emissions targets.	WSEO	Phase 1 - Inventory completed; Phase 2 - Measure Analysis underway.
The state should urge our Congressional delegation to support a national carbon dioxide and greenhouse gas emission target.	Ecology WSEO	No current action.

Environmental regulation and energy decision making		
BPA and the state's electric utilities should incorporate quantifiable costs, including environmental costs, into least-cost planning and modeling.	WSEO UTC	NWPPC, BPA, and several regional utilities consider environmental costs in resource acquisition decisions.
The state encourages more comprehensive assessment of environmental costs in all energy sectors, not just electricity planning.	WSEO UTC	Under assessment.
ENERGY FACILITY SITING		
The Governor should instruct his cabinet to focus its attention on implementing the provisions of the state energy strategy using existing rules, but avoiding costly duplication and ensuring rapid decision making.	WSEO Governor's Office	Energy Strategy Executive Order. ESB-6493 makes the Energy Strategy the primary guide for implementation of the state's energy policy.
WSEO should take the lead in ensuring that supply and conservation projects consistent with the strategy receive fair and rapid treatment by the many state, federal, and local agencies that must review them.	WSEO	Projects underway. WSEO comments on renewable supply proposals and funds CARES position.
BP A and investor-owned utilities should consider funding generic impact investigations, particularly for renewable technologies, so as to narrow the number of issues requiring study during actual siting.	UTC	WSEO has applied to USDOE for GIS mapping of raptor patterns to address wind facility impact.
The legislature should form a siting review panel; similar to the State Environmental Policy Act Review Panel of 1982-83, to develop revised state siting procedures and legislation to implement them.	WSEO	Completed. Committee reached consensus on few issues. No legislation was passed.
ROLE OF STATE ENERGY OFFICE		
WSEO should improve and realign current programs to fit the energy strategy.	WSEO	Mission statement, strategic planning, and reorganization completed.

WSEO should play a leadership role in state government to support the development of new energy resources that are consistent with the strategy.	WSEO	Ongoing. WSEO works with state agencies to support Energy Strategy.
WSEO should take a supportive role with other state agencies, local governments, schools, and others to integrate energy issues in their plans and decisions.	WSEO	Ongoing. WSEO works with state agencies and others and provides information regarding energy options.
WSEO should conduct a number of studies, track certain technological changes, and prepare a number of reports that will provide for timely and informed future decisions concerning energy.	WSEO	Ongoing. WSEO has extensive public outreach efforts and publishes dozens of reports and studies annually.

